Telephony

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THE DRY CELL QUESTION

By D. H. TOWNSEND

Churchill County Telephone & Telegraph System, Fallon, Nevada.

THIS PRACTICAL telephone man says the answer to the dry cell question is "up to you!" Know your sets, your lines, your subscribers; how little or how much the telephone is used; the way it is used or abused; where it is located. Then you will know what dry cell or what make of cell is best to use

REVIEWING the claims made by the various dry cell and "battery" manufacturers during the past several years, no wonder one asks: "Which make shall I use?" To solve the question, the writer during the past two years has carried out extensive experiments with all makes, in actual service—and favors none.

Any *reliable* make of telephone dry cell or "battery" equivalent, used as the manufacturer intends it to be used, will live up to its claims. The real answer to the dry-cell question is up to the individual exchange man himself, but the following discussion may help his decision:

If he gives purely local service; has magneto sets with old, obsolete, low-current-drain transmitters; has subscribers who seldom use the telephone, who have no desire for real transmission, and who are accustomed to "Whoop and Holler" service—then any old make will do! In fact, he might as well dispense with "batteries" entirely and talk through the receiver.

If he has sets with medium-current-drain transmitters, subscribers who appreciate good service and use the telephones *as they should be used*, changes cells at regular intervals, has alert operators watching for weak transmission—*any* reliable make of standard telephone cell or "battery" equivalent is the answer.

On the other hand, if he has sets with heavy-current-drain transmitters; long, heavily-loaded lines on which one must "talk up"; subscribers who use toll service, who talk long and often; plenty of "rubbernecks" on the lines—then the longest life cell on the market is the one to use! And he may have to multiple the cells and change them every few months.

Where and how the telephone cell is to be used is a major item in solving the dry-cell question. Before taking up some individual cases a series of questions and answers on telephone cells may freshen our memories and clarify a few points.

What is a telephone cell?

Just a primary cell! Not a battery—it takes at least two cells to make a battery. By primary cell we mean one that cannot be renewed with a flow of current as in the case of the accumulator or storage battery. In other words, when a telephone dry cell is dead—*it's dead!*

What is the object in life of telephone dry cells?

To deliver small current, at infrequent intervals, over a long period of time. To accomplish this object, high, sustained voltage is necessary.

Why high sustained voltage?

We need the volts—the push—to shove the current through. A half-volt drop in a telephone cell means a 29 per cent loss in transmission; therefore, the more nearly one can approach a constant source of voltage (electrical pressure) of sufficient magnitude to produce satisfactory transmission, the farther is reduced the service problem connected with providing such a source and the nearer one comes to the ideal solution of the magneto telephone "battery" problem.

How are dry cells made?

In the accompanying cross-section view of an excellent telephone cell note, first, a seamless, varnished cardboard tube or carton; it does not absorb moisture and acts as an insulator between cells. Next is the heavy zinc "can" serving both as a container and negative electrode, and then the absorbent paper lining to keep the "mix" from making actual contact with the zinc can.

The large carbon rod in the center is surrounded by a tightly-packed "mix." On top of this mix we find two corrugated paper washers that serve as an expansion chamber for gases. Between the carbon rod and the washers is some white powder, which is nothing more than fine white sand. Note the brass cap solidly attached to the carbon rod, and the positive terminal firmly soldered to this cap.

We also find a large groove deeply indented in the zinc can close to the top of the cell. This groove, together with the bulge of the brass cap, forms a lock securely holding the wax seal. The wax being poured in a molten condition, knits itself with the zinc container, carbon rod, brass cap and corrugated washer, positively sealing the cell—the white sand preventing the molten wax from entering the expansion chamber.

Some manufacturers have used

metal and fibre tops instead of wax, thus allowing more room for the active "mix." They claim their seals permit the gases to escape but prevent the entrance of air that would dry out the wet mix.

The formula for, and the amount of, the "mix" surrounding the carbon rod vary with the different manufacturers, as also does the purity or quality of the ingredients. While the formula is not printed, it is undoubtedly composed of manganese dioxide, powdered carbon or graphite or both, salammoniac, zinc chloride and water.

The quantity of water depends upon the original dryness and fineness of the materials used. Some cells may have a starch or other paste added to improve the electrolyte and promote more even distribution of action.

Mercury, too, is often used to effect amalgamation of the zinc. The manganese acts as a depolarizer, the powdered carbon or graphite being added to give conductivity to the manganese and form a large electrode surface.

How does a dry cell work?

The basic principle of the dry cell is practically the same as that used in the old-fashioned wet cell of 20 years ago. In fact, the modern dry cell is nothing more than a wet cell of the Leclanché type, the liquid electrolyte of that type being replaced by a semi-solid substance that is capable of retaining moisture for a considerable period of time. (The wax seal prevents this moisture from evaporating or drying out.)

As in the Leclanché cell, our dry cell electrodes are of carbon and zinc. The porous cup of the Leclanché cell is represented in the dry cell by the paper lining separating the zinc from the mix.

The positively-charged electrode must not be considered as the carbon rod alone, but rather the rod with its surrounding mix. Such being the case, it is obvious that the separation between the electrodes is very small, while the surface presented by the electrodes is very large. As a result the internal resistance of the cell is small, averaging, perhaps, 0.2 or 0.3 ohm.

As the action of the cell proceeds, zinc chloride and ammonia are formed. There being insufficient water to dissolve the ammonia, there results a formation of double chlorides of zinc and ammonium. These double chlorides, being less soluble, finally occupy the pores of the absorbent paper lining, greatly increasing the internal resistance of the cell. This increase of resistance is further contributed to by the gradual drying out of the mixture as its age increases.

There is also a small local action that takes place within the cell, due to dissimilar metals—such as in soldering the zinc can, soldering terminals, etc.—resulting in a gradual drying out of the moisture. A gradual deterioration takes place, even when the cell is not in use. This action is commonly called "shelf life."

What is the difference between telephone and ignition cells?

The ignition cell's object in life is to deliver heavy current, and to keep delivering it until it "shoots the works" by using itself up—in fact, once started, it continues using itself up even when idle. It does not have the power to build itself up during idle periods as does the telephone cell.

When used for telephone purposes the life of an ignition cell is but half that of a telephone cell. Likewise a telephone cell, designed to deliver small current at infrequent intervals over a long period of time, would not get to first base in heavy ignition work.

What improvements have manufacturers made in recent years?

Many! There is:

Higher sustained voltage. Where long service life in the past was maintained at around 1.10 volts per cell, recent improvements have brought this up to 1.25 volts per cell.

Longer service life. The amperehour capacity of cells has been constantly increased so that now a standard reliable cell will, on light intermittent service, survive 300 days or more.

Increased shelf life. Shelf life was problematical with early dry cells, but now it is not uncommon to hear of instances where cells, under certain conditions, have tested good when two or more years old. In fact, the second Byrd Expedition, when it arrived at Little America, found the "batteries" installed and used in the telephone system four years previous still able to give transmission.

What effect has temperature on dry cells?

Heat drys out the cell. Dry cells keep best in a cool place but should be used at normal room temperature. Low temperature reduces the amperage temporarily but does not injure the cell.

The current will be restored when the cell is "normal" or about 70 degrees—and it may take 24 hours in a moderately warm room for a badly-chilled cell to get back to normal. This may answer the question as to why some rural telephones are poor talkers on real snappy cold mornings.

What does the date on a cell mean?

It means that the cell may be stored, unused, until that date without appreciable deterioration and that most, if not all, of its full value may be obtained if put in service not later than that particular date. It does not mean the cell will expire at that time; neither does it mean the cell will last that long, no matter how used.

In other words, it means just what one manufacturer states: "For best results put in service by (such-and-such-a-date)." Please note this date is now many *months* in the future instead of *days* or *weeks*, as in the past.

Should cells be tested with a battery tester?

That depends upon what you call a "battery tester." If you refer to the ammeter used in some stores, no! The reading in amperes has no meaning; the ammeter might read as low as eight or as high as 20 amperes on good cells. The low resist-

COMING CONVENTIONS

Minnesota Telephone Association, Radisson Hotel, Minneapolis, January 28, 29 and 30.

Nebraska Telephone Association, Hotel Clarke, Hastings, February 12 and 13.

The Texas Telephone Association, Baker Hotel, Dallas, March 10, 11 and 12.

Oklahoma Telephone Association, Oklahoma City, March 17 and 18.

Wisconsin Locally Owned Telephone Group, Park Hotel, Madison, March 24.

Wisconsin State Telephone Association, Park Hotel, Madison, March 24, 25 and 26.

Iowa Independent Telephone Association, Hotel Fort Des Moines, Des Moines, April 7, 8 and 9.

Ohio Independent Telephone Association, Deshler-Wallick Hotel, Columbus, April 22 and 23.

Indiana Telephone Association, Claypool Hotel, Indianapolis, April 29 and 30.

Kansas Telephone Association, Hotel Sunflower, Abilene, May 12 and 13.

ance of the ammeter puts a "short" on the cell, just as much of a short as a piece of wire.

Follow the Bureau of Standards voltmeter test. Use, for one cell, a voltmeter with a scale of 0 to 3 volts; bridge this meter with a resistance of 6.666 ohms; connect, with proper polarity, to the cell. If after one minute the cell drops to 0.93 volt, it has reached the "cut-off point" and should be discarded.

Cells may also be tested in service—connected to the telephone—by the voltmeter method, omitting the bridging resistance. Connect the voltmeter to the cells; remove the receiver from hook. If after one minute the two cells drop to around two volts—or three cells drop to around 2.95 volts—replace them.

Now let's start using our telephone dry cells. Pick our cells, or make of cells, for particular jobs.

Casting no reflections on the manufacturer—it was a good set in its day—we have a Western Electric old model 1317AH magneto set with a No. 250 transmitter (non-insulated) mounted on a hat-rack arm; ages old! It should have been pensioned or junked years ago, for it is not listed in the manufacturer's catalogs, even in those of recent years. That's all true, but these sets are numerous around certain exchanges.

Take three dry cells of any standard make, install them in this set and connect a milliammeter, 0-500 range, in series with them. Speak, shout, "holler" or scream into the transmitter—the meter needle barely moves.

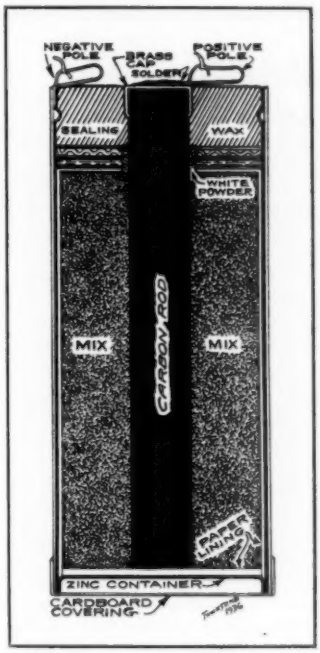
Due to ripe old age that transmitter's resistance has gone so high that little or no current is drawn from the cells; therefore, they will last indefinitely. But *remember*: outgoing transmission is in proportion to the current modulated by the transmitter.

Ask that manufacturer's representative to explain how his present model transmitter is approximately four times more efficient; how you can improve transmission by simply changing transmitters, but that when you do change, the "batteries" will not last forever.

Next we find a set that's modern; it has a universal or medium current-drain transmitter. The set is designed throughout to give good transmission over local lines, medium-loaded lines and good toll circuits.

Let's try two cells: hook up our milliammeter, lift the receiver from the hook. The meter needle starts up, going to 150 or possibly 200; then it drops back, finally resting at about 50. Speak into the transmitter and note that the needle of the meter follows every sound of the voice.

Leave the receiver off the hook a few minutes. There is a steady current drain of around 50 milliamperes. Imagine the condition of the cells if



Cross-Section View of a Telephone Dry Cell.

the receiver were left off the hook all night! Could you expect the manufacturer to replace those cells if they "went dead" a short time later?

Restore the receiver to the hook. You can use *any reliable* make of standard telephone cells, or battery equivalents, in this set and get full service life—if your subscriber uses the telephone as it should be used. If he talks long and often or "rubbers," then *any* cell will require replacing before you think it really should be changed.

Now we find a set with a heavy current-drain transmitter. This set is designed to "talk up"—to give *real* transmission on long, heavily-loaded lines. Just like a car—the more power you have, the more gas it takes. Install the two, or the three, cells of *any* make, connected as shown on the set's circuit label. Connect your meter; lift the receiver. Note the needle climb! 150—200—300—350MA! Will it ever stop? Perhaps, say, around 400.

Speak into the transmitter with lips close to the mouthpiece; use a firm, even tone of voice—the real way to telephone. Note that the meter needle fluctuates from anywhere around 75 or 100 to 250 or 300 milliammeters, following each voice tone. *Some* current drain! But, Boy, Oh, Boy! the party at the other end of the line can sure hear you.

Now "rubber," listen-in; place the palm of the hand flat against the mouthpiece so the people talking on the line will not hear you listening-in. What? The meter needle has gone to 500 and off the scale? Sure, the pressure of your hand has decreased the transmitter resistance, just about shorted out the carbon grains; even the back of the transmitter is getting hot.

You feel certain that no inferior make of cell will last long in that set; likewise you know you must use the longest life cell on the market, and perhaps, if the telephone is used much, even multiple the cells and change them "more than once a year."

Ever see a colder place than the outside wall of a farmhouse kitchen on a snappy, below zero morning? Ever see a thing warm up more quickly than that big kitchen range? The telephone is right beside the range—a very poor place for it. The installer did not know, did not care, or else was afraid to tell the subscriber about the poor location. Cells get too hot during summer months, and during winter the sudden temperature changes make metal sweat.

Look inside the cabinet. The generator magnets have started to rust; likewise the core wires of the induction coil. How about the zinc cans of the cells? They will be covered with moisture too. See where the seamless, varnished cardboard tubes insulate the cells from each other?

Does this help answer the question as to why that telephone has been a poor talker at times?

How about the highway patrol telephone? It is a metal, mine-type set, out on a pole exposed to all kinds of weather. Metal sweats; moisture forms. The set manufacturer has moisture-proofed the induction coil and other interior parts. I would suggest using the marine type telephone cell for this set.

In addition to the usual cardboard covering, this cell has been given a special paraffin treatment to render it more nearly moisture-proof; the treatment also helps to prevent drying out. This particular cell may, at extreme old age, due to gas expansion and other causes, rip open straight down the zinc can; but until that time you will get long service, no matter what type transmitter is used.

How about desk stands? Queer

why many installers will place the dry cells many, many feet from the desk set box and use too small a wire; then they swear the cells are not as good as the manufacturer claimed them to be. Likewise the man who uses the nut type terminals instead of standard spring clips. Turning the generator crank causes vibration that in time loosens the connections. A case of "noisy line" is finally traced down to a noisy telephone and the noisy telephone to loose battery connections.

We know that, where subscribers talk long and often, multipling the cells, while giving the same voltage, will lengthen the period of service life. The extra set of cells costs less than the labor of making more frequent changes.

One manufacturer has made use of this multiple principle to produce a three-volt telephone battery. He has conserved space, reduced weight and shipping charges. Using a combination of carefully matched dry cell units—known as "F" size cells—four units are connected in multiple to give 1½ volts. These, in turn, are connected in series with another group to produce the required three volts. Correctly named a "battery," it has the same electrical equivalents as two standard No. 6 size telephone cells.

The writer put this type units in service months before they were advertised. They were placed in sets with medium current-drain transmitters, with subscribers making normal use of the set. After 12 to 13 months in service many units have tested good; again, some have gone dead, almost over night. This also applies to standard size cells of the leading brands and to special long-life cells. Preceding paragraphs have explained the causes for the failures.

Keep your office records in your office, not at the subscriber's house. A card record or chart listing each subscriber's telephone is the proper place to record "battery changes." A quick glance tells the age of any cell. The subscriber's response to the operator's "Number, please?" is usually of too short a duration to spot dying cells; but a two-minute conversation will do the trick.

If the volume starts to drop, to fade out, it is time to change—and when you do change cells, *do it right!* Don't just change batteries and run. Take time to wipe dust off the cabinet; *clean* the mouthpiece and receiver cap; check all connections. *Service the set!* Surely you are not afraid or ashamed to let the subscriber know you are deeply interested in his telephone. A clean telephone works best! Set a good example for your subscribers to follow.

All-in-all, the answer to the dry cell question is up to you. Know your sets, your lines, your subscribers; how little or how much each telephone is used; the way it is used or abused; where it is located. Then you will *know* what cell or what make of cell to use. The "battery" manufacturers have done their part. They, in fact, are years ahead of you. You get just what you pay for—how well you use what you pay for depends on you.

SALES TRAINING

By MISS ANNE BARNES

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

THE day for untrained sales-people in any reputable business concern is at an end. Today, sales-people must be trained not only to have a thorough knowledge of the firm's merchandise but also know the various types of people who come into the store, and how to sell merchandise. In addition to these factors, they must be good in arithmetic, spelling, and writing.

The school-girl who slipshods her way through school has a poor chance of getting employment in a business concern whose requirements for employes are on a high level. I was very much surprised to learn lately that the trained sales-person is able to recognize and classify customer types, of which there are several, as soon as a transaction is opened between herself and customer. Also, that most customers run true to type.

When I heard this, I asked myself these questions:

"Well, where do I belong in respect to a sales-person's classification? Am I in more than one class depending upon who waits on me? Is the classification a standard one?"

My informant told me how she recognized and handled certain types of customers. "They are classed into about seven groups," she said. "I will tell you about a few of the most common types":

When a customer does not make a decision until she has looked over a lot of merchandise, she is classified as "deliberate." She must be handled with care for if she does not satisfy herself that she has been shown everything in the kind of merchandise she is seeking, she makes a poor future customer.

When a customer inspects the merchandise shown her without making any comments, the sales-person knows at once she must show her as much as possible of what she has asked to see and watch closely to see how she reacts as she inspects the merchandise. Sometimes she makes a selection, with little or no comment, and walks out. Of course, such a type is disconcerting but the sales-person feels that this "silent"-type customer knew what she wanted and that, if she is shown the right thing, she is ready to close the transaction at once.

It is not difficult to handle and close a sale with the "distrustful" type. The sales-person has to show the good points of the merchandise and use some reasoning in her sales talk. If she wins the confidence of one of this type, well and good. However, a person of the suspicious type is rarely cured. She usually goes away with the impression that she was too smart to be cheated.

The sort of customer most sales-persons have difficulty in selling are those belonging to the "undecided, vacillating" type. If such a customer is not handled with the greatest care, even though she does buy, she is likely to return the merchandise as unsatisfactory.

So the sales-person does more than show her the merchandise. She uses her own power of concentration and suggestion on not more than three merchandise items in which the customer appears to be particularly interested and eliminates the rest. By doing this she finds that the customer soon narrows down her interest to the one best suited to her needs.

So you see the up-to-date sales-person does more than stand behind the counter and display merchandise on request; and so does the modern telephone operator through her "voice personality" in her contacts with customers.

IN THE NATION'S CAPITAL

By FRANCIS X. WELCH,
Special Washington Correspondent for
TELEPHONY

WITH A FLOCK of bonus money about to be let loose, there is likely to be a gay old time all over this star-spangled land, unless the ex-doughboys have developed a greater sense of restraint than they had the last time the keg was tapped. At first blush, one would suppose that the clothing merchants, automobile dealers, and other purveyors of more transient commodities would profit most from the wide distribution of such windfalls, as compared with an industry such as the telephone company, which sells a continuous service.

But it all comes out pretty even in the end. There is many a small butcher, baker, and candlestick maker who will get just enough out of this in the form of new business and payment of old debts to put in that telephone or extension which has been disconnected since 1930.

In truth, according to that most excellent economic analysis, "America's Capacity to Consume," published two years ago by the Brookings Institute of Washington, D. C., utilities stand to gain more revenue, proportionately, from any wider distribution of purchasing power than many other industries. It would be out of place to reproduce here the rather detailed statistics of the Institute.

In general, the book sets forth a table of various income levels: $1,000 a year per family, $1,500 a year, less than $1,000, etc. It shows just how much each class spends for food, rent, clothing, etc., as compared with other classes. Thus we can readily forecast which way the dollars will be spent when, by virtue of increased spending power, a big bunch of families is lifted out of one class and put into another.

THE REASONING is inescapable. Consumption of things to eat and things to wear has a practical limit. We are not likely to eat more than three meals a day, no matter how much more money we are lucky enough to make. The quality and cost may increase, but only to some extent. We may shift from Joe's lunch wagon to the cafe with the pretty blond waitress, but it is clear that there is a reasonable limit to what people are likely to spend on their stomachs or on their backs.

With utility service, however, the saturation point (in the approximate — not the strict economic sense) is much farther away. Electric and gas utilities have almost unlimited possibilities, while the telephone utility still has enough idle plant capacity, resulting from depression disconnections, to know that the business is there if ever the ex-subscribers can get hold of enough money to come back.

Let it be understood that this is written, not as propaganda for the Townsend Plan, Share-the-Wealth, Soak-the-Rich, or any other schemes for redistributing either income or capital wealth. It is merely to point out that if, as, and when purchasing power is restored to the masses and to the extent that it is restored, the utilities and the telephone industry will get theirs.

AND WHAT, you are probably asking, has all this to do with Washington, D. C.? The answer is: A great deal, but in a roundabout way. The matter is definitely connected with what the Federal Communications Commission is going to do about telephone depreciation rates. Of course, the commission is not likely to do anything about depreciation rates until the Bell investigation is out of the way.

The reason for this is that the commission is depending on the investigation to show that in the past, and perhaps even during recent years, the Bell companies have been putting away too much depreciation money, and that this may be the reason for the "reserves" from which the A. T. & T. paid the regular $9 dividend, while earnings were slipping and skidding toward the $5 mark.

Last week, President Gifford of the A. T. & T. announced that things were getting better. The parent company is now earning about $7 a share as compared with $5.96 in 1934; but, even assuming a galloping recovery, the system will still have to run partially on its own fat for at least two more years.

Where did these earnings come from and where did these reserves come from? There is too much speculation as to the possible relationship between unusual depreciation funds in the Bell treasury and the payment of unearned dividends for the commission to overlook such a tempting line of inquiry.

AS FAR AS GROSS business is concerned, prospects were never brighter for real recovery in the telephone business than they are right now. Standard Statistics predicts that station connections "will rise to the 1930 peak within the next few years." Ordinarily, any pickup in the telephone business is offset by the industry's inherent and peculiar problem—the rise in capital costs per unit of service with the increase in subscribers.

However, the field, as a whole, will be rid of this pesky difficulty for the next few years at least, for the simple reason that it had excess plant capacity even in 1930 and, therefore, the pick-up will be principally in the nature of reconnecting old subscribers for which provision has already been made.

Looks very rosy, doesn't it? But here is where Washington enters into the picture. Put it down once and for all that this rise in gross revenue is going to be offset by regulatory orders cutting down earnings that might otherwise be anticipated. The Federal Communications Commission has made up its mind—although it regulates interstate business only—that it will get lower rates for telephone service if it can.

This means not only the usual cut down in the rates of return, but also trimming and strict surveillance of depreciation charges and other operating costs. "Low-rates-or-bust" isn't the official commission position, of course, but Washington observers are agreed that it is one of the chief objectives, if not the chief objective, of every Federal regulatory commission. Acting in concert with the Federal board, we may see the state commissions, all having the same idea. Already we have seen the Bell System challenged in the courts by the stronger state bodies.

AND SPEAKING of what the courts can do to regulation, it must be recalled that in the Lindheimer case (Illinois Bell Chicago coin-box case), decided early in 1934, the way was opened for regulatory commissions, both Federal and state, to dig into and regulate de-

To a Telephone Directory Advertising Salesman

"IF"

(With Apologies to the Late Rudyard Kipling)
By Gertrude R. Longstreth, L. M. Berry & Co., Dayton, Ohio

If you can make your sales when all about you
They're falling down and blaming it on you;
If you can like the firm when they all razz it
And make allowance for their razzing, too—

If you can wait and not grow tired of waiting
Till your expense check comes and you can eat;
And being hungry, still keep sweet and cheerful
And never lay off work or get cold feet;

If you can sell, and always make the quota
And yet not just the quota as your aim;
If you can see your best contracts rejected—
And go out and sell the same darn space again;

If you can bear to see your monthly statement
Show several hundred dollars in the red
With charge-offs dating back a month of Sundays—
Yet never lose your temper or your head;

If you can sell a thousand dollar contract
As nonchalantly as you sell a card—
If you can sell bold types from dawn to twilight
And never say 'Let's quit—it's too darn hard!'

If you can get the crew that's working with you
To keep on selling after you are gone
When they are sick and tired of the canvass
With not an ounce of pep to spur them on—

If you can fill with paying advertising
Each book you work on, whether small or large—
Then you, my son, are sure a darn good salesman
And what is more—you ought to be in charge!

preciation rates just as strictly as the rate of return.

In fact, many serious students of regulation believe that the Lindheimer case (TELEPHONY of May 12, 1934) forecasts a new trend for all utility regulation, inasmuch as the depreciation reserve is no longer sacred property of the company but can be utilized by a regulatory commission to justify a reduction in earnings that might otherwise be held confiscatory. Just how far the courts will let the commissions go in this respect remains to be seen.

Of course, all this won't happen today or tomorrow, and it would be an absolutely insane stunt to sell the telephone industry short just as it stands on the threshold of certain business recovery. Reasonable profits are all any fair and honest telephone company executive desires. Living on reserves is an unhealthy situation which he does not desire.

It calls to mind a statement made just last week before the Senate committee (investigating munition and banking activities during the World War) by J. P. Morgan:

"In a war you live on capital, and that gives a wonderful sense of luxury; I've tried it. And when the war is over, you go back to living on earnings. That isn't so pleasant."

Well, the war on depression is over, or at least we hope so. Getting back to an earning basis may mean tightening the belt for some companies, but who can tell what may result? It is not inconceivable that the necessity of operating under restricted earnings will drive the fertile inventive genius that has always characterized American telephony to unparalleled successes.

Telephone engineers may yet conquer that Gordian problem of making the operating cost per unit go down in proportion to the increase in service consumption, just as it naturally does in the gas and electric fields. If the forthcoming era of stricter regulation were thus to divert the so-called profit incentive to the accomplishment of such new technical victories, it would indeed be a glorious double triumph—for commission regulation and for the profit system itself.

IT SEEMS probable that the Connery resolution for a House investigation of the FCC will ultimately be approved. There are too many factions that want it. Representative Connery of Massachusetts is a good Knight of Columbus and he is anxious for a chance to take a few pokes at the Mexican Government for sponsoring alleged indecent broadcasts. Other New England members, such as Mr. Wigglesworth, Republican of Massachusetts, support him for the same reason. (Mr. Connery has never forgiven the FCC for politely pigeonholing a protest made last April by 16 House members.)

And, of course, there are the headline hunting professional "investigators" who welcome a probe of anything at any time so long as they can be in on it. Some of the radicals would like a chance to "expose" alleged dictatorial censorship.

More recently the Republicans, taking their cue from G. O. P. chief, Henry P. Fletcher, have also developed a sudden devotion for "freedom of the air," especially freedom from what they think is Democratic censorship. This would appear to make it about unanimous, but the Democratic chiefs turned cold when it appeared that the thing might lend itself to making political capital for the Republicans.

They are trying to torpedo the resolution, but it seems to this observer that it can't be stopped. The irony of the situation is that the Federal Communications Commission, in large measure, brought it all on itself by fussing around with silly bribe rumors for the edification of the press. But you can paste this in your hat: "The House committee won't confine itself to bribe rumors!"

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Upturn in Business Reflected in A. T. & T. Report

Walter S. Gifford, president of the American Telephone & Telegraph Co., reported recently to the company's stockholders that the Bell System experienced a net gain of some 460,000 telephones during 1935. This represents an increase of 3.5 per cent as compared with the preceding year. The total number of telephones in service December 31, 1935, however, was 11.2 per cent less than the maximum development reached in 1930.

According to Mr. Gifford the total number of toll and long distance calls completed by the Bell System companies was approximately 4.5 per cent greater than in 1934.

Preliminary figures as to the consolidated earnings applicable to A. T. & T. Co. stock were about $7 per share as compared with $5.96 per share in 1934.

SPEECH TRAINING

By GLADYS CASNER

FOURTH OF A SERIES of articles on voice technique for aiding supervisors and chief operators in helping operators to overcome speech difficulties. The course is dedicated to all telephone women of yesterday, of today and of a challenging tomorrow. This article discusses unhealthy speech organs and the misuse of one's speech organs, and suggests some helpful remedies. Read it and benefit

THE PRODUCTION of speech is a complex problem depending on the physical shape and proper use of one's speech organs, and the perfect working order of the central nervous system. The supervisors who are to help in the correction of speech defects must know how, when, and why their operators' speech is defective.

Unhealthy Speech Organs

Let us first consider the faults of speech according to physical conditions:

1. THE NOSE.

The resonating cavities of the nose are essential in producing a full and clear tone. The common cold, a catarrhal condition, diseased adenoids, abnormal growths in the nose or pharynx, or an obstruction of the nose from injury, will make a congestion of the air passages and bad quality of voice will be the result.

One will have more trouble with the nasal consonants *m*, *n*, and *ng* than any other sound. An operator who has frequent colds may easily form the habit of "speaking through her nose," which means she thinks she cannot let her breath issue through her nose.

Each telephone operator could help her voice by observing the rules for preventing colds as given in the Bell System's health course, especially her "winter time" voice. After any existing physical fault of the voice has been corrected, take the following exercises for the proper renewal of the functions of the soft palate:

A. Yawn a number of times. The throat will be relaxed and the soft palate will be in its normal position. Try to realize its position.

B. Strengthen the soft palate by whistling and singing.

C. Take in quick, short breaths; feel the palate rise.

D. Yawn and take note of the position of the palate as it is brought up and back.

2. THE LIPS.

There are practically only two reasons for the lips to bother one in sound production. One is the hare-lip, which only the physician can treat. The other is the too large lips, which are not easily managed.

One must be very careful of all the vowel sounds and the consonant sounds that include the bi-labials *p*, *b*, *m* and *w*, and the labio-dentals *f* and *v*. Exercises will be given in another instalment to prevent what the British call our American lip laziness.

3. THE TEETH.

If one's teeth are worn, if there are missing lower or upper teeth, protruding upper or lower teeth, or unusually large or small teeth, one will have trouble with her labio-dental consonant sounds (*f*, *v*) and the dental consonants, including the voiced and voiceless. If a dentist's treatment cannot remedy this condition, one should practice the sounds previously listed until a proper shape of the mouth will produce the correct sound.

4. SOFT PALATE.

A cleft or cut palate can be successfully treated only by a physician in sewing the palate or substituting an artificial one.

5. ABNORMALITIES OF VOCAL CORDS.

The condition involving abnormalities of vocal cords will not be found among the members of an operating force. It is possible to obtain an artificial larynx, however.

6. TONGUE.

An over-large tongue will cause speech to become a clumsy process, if one does not make an effort to adjust oneself to its use in producing speech sounds. In your spare time, practice speaking with a mirror before you and notice in what way you can make the best individual sound. Practice making the sound in this manner until it becomes a habit. Any weakness in tongue, lips, or soft palate will result in "lisping," "lolling" or "nasality."

7. THE EARS

If her hearing is poor, the operator's voice will probably become monotonous, and she will speak at either too high a pitch or too loud a tone. She will probably not be aware of any bad qualities of voice until brought to her attention by a supervisor. The operator with faulty hearing should consult an ear specialist at once.

The mouth must be free of any obstruction. "Chewing gum" speech will convince one of that truth. Speaking with too much saliva in the mouth is unpleasant to the hearer. This habit is an outstanding characteristic of the negro race and is certainly to be discouraged among members of an operating force.

The entire body must be healthy or it will reflect in one's voice. A body that is weak physically produces a weak and dull voice.

Wrong Use of Speech Organs

Good speech is rarely a gift—it is usually the result of persistent effort. A poor voice and careless speech may have been our companions for years, but our aim is to rededicate ourselves and find better companions through the proper use of our organs of speech.

Nasality, or too much sound coming through the nose, is one of the most common examples of misuse of the voice. It may be caused by bad tonsils, cleft palate, wrong placement of voice, or rigidity of the soft palate. Closely associated with this

speech fault is the nasal twang which occurs when too much sound comes through the mouth.

If there are diseased adenoids or any abnormal growth, an operation is the only remedy; if there is not a physical defect, then one must practice letting the breath come through the nose by concentration on correct habits of speech.

To test whether one has a defect of nasality, sound the vowels while the nostrils are closed. If vowels are sounded correctly there will not be any vibration in the nose and the obstruction will have no influence on the sound. If there is a vibration, nasality is present. Practice the vowels until the vibration disappears, and the nasality will disappear with it.

Through fatigue one may develop nasality. If you come to work tired, your subscriber will suffer as a result. The muscles of one's throat will slump, the soft palate hanging lower than it should, and thus cutting off the air passages from throat to nose.

Practice these vowels with closed nostrils: *Ah, a, ee, ah, oh, oo.*

To strengthen the soft palate so that it will not cause nasality, practice with a mirror saying *ah* and watching the palate rise. Yawn to relax and make an "open throat." Now notice the position of the palate. To prevent nasality, one must develop the power to raise and lower the soft palate at will.

Lack of resonance occurs when the voice is produced without any assistance of the head cavities. It is important that these resonators be used —not only in making good quality tone but as a matter of health.

These resonators are constantly secreting a fluid. If air is allowed to reach this fluid, it is kept in constant circulation. If the air does not reach the cavities, the cells become clogged and, in time, a catarrhal condition will be the result. Large adenoidal growths may keep air from the resonators and, unless they are removed, both your voice and health will be seriously affected.

As a result of a growth or a bad habit, one may quit using her head resonators. It is essential—in preventing dull, lifeless tones—to begin using them.

The sounds *n*, *ng*, and *m* require the greatest head resonance. The pharynx and back of the mouth must be free from obstruction and all muscles free from rigidity.

Hum the sound *n* and feel the vibration between the tip of the tongue. Hum any song and feel vibration in the cheek bones, the resonance pushing out between the ears and into top of the head. Hum all three sounds, *n*, *ng*, and *m*. Place palm of the hand over the face, the other palm on higher part of the forehead. By the vibration one may determine whether or not she is using her head resonators.

These poems are recommended for resonance drills:

The union of lakes, the union of lands,
The union of states none can sever,
The union of hearts, the union of lands,
And the flag of the Union forever.
—George P. Morris

Ring out, wild bells, to the wild sky,
The flying cloud, the frosty light;
The year is dying in the night;
Ring out, wild bells, and let him die.

Ring out the old, ring in the new,
Ring, happy bells, across the snow;
The year is going, let him go;
Ring out the false, ring in the true.

Ring out the grief that saps the mind,
For those that here we see no more;
Ring out the feud of rich and poor;
Ring in redress to all mankind.
—Tennyson

The transmitter of one's headset acts in the same capacity, in transmission resonation, as the head resonators act for the ordinary speaking voice. Both are necessary for a good telephone voice.

To understand how necessary the transmitter and head resonators are, play an old-fashioned phonograph without the horn. Note how lifeless and flat any record will play. Then replace the horn and note the difference in tone.

A monotonous tone is more irritating to the majority of subscribers than a high-pitched voice. It denotes indifference and lack of feeling. To be truly interested in one's work is to eliminate most of the "sing song" voice. To develop a vigorous and animated tone, read aloud any prose or poetry that is interesting to you and that has a fast tempo.

If you have witnessed the motion pictures, "Bring 'Em Back Alive" or "Trader Horn," practice the different animal cries you heard. Or if you do not recall any of them, practice meowing like a cat, mooing like a cow, roaring like a lion, barking or howling like a coyote, growling like a tiger or bleating like a lamb.

A weak or dull voice comes either from being physically weak and despondent or from incorrect breathing. A right mental attitude and a practice of the breathing exercises suggested will correct this fault.

High-pitched tones are caused by rapid vibrations of the vocal cords as a result of the cords being drawn too tightly. It is generally caused by chest breathing. Take exercises in diaphragmatic b r e a t h i n g. Deep breathing will lower the pitch of one's voice.

A "breathy" voice is the result of improper breathing. The firmness of all tone is dependent on breath control. A breathy tone is easily distinguished and easily overcome if one makes a sincere effort. Such a tone leaves one's hearer almost gasping for breath. Taking enough air into the lungs to carry over to the first pause in one's speech will eliminate this speech fault.

Too loud a tone of voice is inexcusable for an operator, although the average subscriber feels that he must talk much louder to be heard on a long distance call. We frequently expel too much breath at one time. This condition is easily remedied by breathing exercises.

A muffled voice occurs when one tries to slur over difficult sounds or does not open the mouth enough or use the lips sufficiently in pronunciation. Let us overcome our "lazy lip" habit. Read the following portions of poems, making a special effort to use the lips and open the mouth enough to articulate and enunciate clearly and distinctly:

Oh East is East, and West is West, and
never the twain shall meet,
Till Earth and Sky stand presently at
God's great judgment seat;
But there is neither East nor West,
border, nor breed, nor birth,
When two strong men stand face to
face, though they come from the
ends of the earth!
(From The Ballad of East and West by Rudyard Kipling.)

The wind was a torrent of darkness
among the gusty trees,
The moon was a ghastly galleon tossed
upon cloudy seas,
The road was a ribbon of moonlight
over the purple moor,
And the highwayman came riding,
Riding, riding,
The highwayman came riding, up to
the old inn-door.
(From The Highwayman by Alfred Noyes.)

The tongue has been called the chief organ of speech. Distinct articulation and clear enunciation depend largely on the flexibility of the tongue. Sloven articulation may come from rigidity of the tongue or lips. Take these exercises for making the tongue flexible:

1. Point the tongue outward and upward toward the nose. Try to touch the nose.

2. Wag the tip of the tongue up and down.

3. Repeat the exercise ten times.

4. Rotate tongue around the lips as a child would do in getting food from his mouth.

5. Rotate first from right corner of mouth, then from the left.

The Operators' Corner

By MRS. MAYME WORKMAN
Traffic Supervisor, The Illinois Telephone Association, Springfield, Ill.

METHOD OF passing "WH" reports to toll center. CLR tributary operators. Series No. 227

WHEN A party reports that he is ready to talk on an inward call, ask "What place called you, please?" unless he volunteers this information. If the call is to a place to which you are not authorized to handle calls, obtain the party's number, station designation, or code ring unless you know it, and the name of the called party.

Make a memorandum of the report and say, "One moment, please?" and cut out. Reach Long Distance and pass all the details received, saying, for example, "(Called place) (called number) (called party) WH on line for (Calling place," adding, "Operator (number)," if the called party has given the number of the operator he wishes to reach in the calling place. As soon as acknowledgment is received, establish the connection, cut out, and cross and file the memorandum.

If the called party has hung up his receiver, substitute the word, "Released" for the expression "WH on line," and if Long Distance orders you to hold the trunk, continue to hold it, acknowledge her order by saying, "Right."

When you receive a WH report, if the distant operator says, for example, "(Called place) (called number) (called party) WH on line," understand that the called party is holding the line. If the report is "(Called place) (called number) (called party) WH released," understand that the distant operator is holding the called line but not the called party.

Acknowledge the report by saying, "Right," if you understand each detail, locate the leave-word ticket, and secure the calling line. If the called party is holding the line, say, "One moment, please? Mr. (Called party)," reach the calling station and proceed in the usual way.

If the called party is not holding the line, reach the distant operator and say, "Ring (called number)," and remain cut in waiting for an answer from the called station. When the called station answers announce the call in the usual way, add, "One moment, please?" and proceed with the call.

Questions from Illinois Operators

1. Should a messenger charge be made when telephone called is out of order?
2. What is the correct way to pass a "WH" report to our toll center?
3. What information do you give the subscriber calling a distant station when he asks for a party who has a non-published telephone?
4. On a station-to-station call where your party is holding the line and hears the distant operator give a report—"Dr. Conley is not in but there will be someone to take the calls at 2:00 p. m."—party cancels call. Should a report charge be made?
5. On a direct circuit point, if a number is busy and the operator asks you to hold the circuit, at the end of five minutes the number is still busy, she asks you to release the circuit. Should she call you for the number or should we AG the call?

For the answers to these questions, please turn to page 26.

One cannot speak with the least possible effort and expect to be understood. Sloven articulation is a lazy habit. The human voice has been called the perfect music instrument. By keeping one's body healthy and correctly using one's speech organs, the voice will remain a perfect musical instrument.

And in Review,

Do YOU Know?

1. How the common cold affects the quality of the voice?
2. Why gum-chewing is undesirable in the operating room?
3. Some exercises for increasing the usefulness of the soft palate?
4. A few causes of nasality?
5. What are the main causes of careless articulation?

Another article in this series on "Speech Training" will be published in an early issue of TELEPHONY.

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The Telephone's Inception in Australia

Some interesting history on the inception of telephone service in Australia was presented by J. W. Kitto, deputy director of post and telegraph in New South Wales, Australia, in a recent talk before the Rotary Club of Sydney on his retirement after 50 years of service. Excerpts from his remarks follow:

"The communication method used most freely in business today is the telephone. Its development certainly has been romantic. In 1880 Charles Hayes, who was connected with the exchange in Sydney, went to Melbourne. There he met a gentleman from America, who interested him in the telephone which had been but recently brought into use in that country. Mr. Hayes returned to Sydney, eager to interest the postal authorities. His representations were received coldly. The suggestion that the telegraph poles along the main streets might be utilized for the carrying of telephone wires was not acceptable.

Alexander Campbell, who was then postmaster-general, was also chairman of the royal exchange. He authorized the erection of a trial line between the post office and the royal exchange. Other lines were quickly erected from the exchange to certain business houses. The telephone worked admirably, but soon after its establishment electric lighting was introduced into Australia.

A banquet was arranged in the exchange building at which the use of this new illuminant was to be demonstrated. The wires conveying the power entered the building close to the telephone lines. The night was stormy and the wires were brought into contact. A conflagration ensued and the telephone switchboard was destroyed.

The postal authorities had by this time realized the importance of the telephone and its possibilities in trade and commerce. A switchboard was erected on postal premises, and so from that night of disaster there came the postal control of telephone services.

There have been many improvements upon the equipment first employed in telephone conversations. Most of our metropolitan exchanges are now automatic and we have communication with telephones in most countries of the world. In 1883 there were 405 telephones in New South Wales. Today there are over 200,000. The rapid growth of the telephone is of special interest when it is remembered that less than 60 years have passed since the telephone carried its first message."

Communication — and World Commerce

THE INFLUENCE of improved communication facilities upon international trade. Along with transportation, money and merchandise—communication is bringing about the dawn of a new era in world commerce. One of series of articles published by Importers Guide which is circulated abroad

NOT LONG ago, a business man sat at his desk in New York City and spoke over his telephone to an assistant in an adjoining room. Such an incident is so commonplace today that under ordinary circumstances, it would not deserve mention. Yet this conversation was the crowning achievement of a new epoch in the history of communication.

For the words exchanged between those two individuals that day traveled completely around the world, approximately 27,000 miles over land, through the air and under the sea before they reached the ears for which they were intended. From New York City to San Francisco by land telephone line, across the Pacific to Java and thence to Amsterdam by radio to London by undersea cable and back to New York by radio, these voices sped *in one fourth of a second!* Perhaps nothing better typifies the breath-taking progress which man's inventiveness has made in the complete annihilation of time and distance than this astounding demonstration of communication.

The amazing flexibility and speed of the world's communication facilities make it extremely difficult to realize that actually modern business is little more than one generation removed from the stone age of communication. Yet such is the case. The transition from the throbbing tom-toms of the African jungle to the speeding of the soft-spoken voice around the world with the rapidity of light has been made in less than 100 years.

For almost 7,000 years of reliably recorded history, the development in the art of communication was limited to the development of actual transportation facilities. As a matter of fact until the taming of electricity and the substitution of sound for sight in the transmission of man's thoughts the speed with which messages could be exchanged was governed largely by the time it took a messenger to travel from any given spot to another.

The world's communications records contain some exceptions to this general conclusion, of course. For some thousands of years before the introduction of the telephone and radio, there were instances of visual or audible transmission of messages such as the heliograph, the beating drum and the smoke column, but the practice of such forms of signaling was extremely limited and of little significance in the commercial relations of one country with another.

The constant groping for speed and completeness in communication did not flower into fruitfulness until electricity was utilized. The postal service established first by the Roman emperors with frequent relays of fast horses was an important factor in the unification of their empire, and this intelligent example was subsequently followed by other crowned heads of Europe. Strangely enough, however, the privileges of the post were a royal prerogative until the 16th century and merchants and business men prior to that period derived little benefit from it.

The first public mail service was inaugurated in 1516 between Berlin and Vienna. While there were slight improvements in speed and reliability of subsequent mail routes during the next three centuries, it was not until the 1840's that communications began to break away from the physical limitation of actual transportation of the message.

Although Samuel Morse, of New York, had developed the telegraph in a crude form by 1832 and had constantly attempted to obtain recognition, the cataclysm in communication which this invention was to precipitate was little suspected until 12 years later. On May 26, 1844, the stage was set for a demonstration that was to be the opening gun in a communications revolution.

On that date the democratic party in its national convention in Baltimore nominated Senator Wright for vice-presidency of the United States. Over a telegraph line which Morse had strung 40 miles to Washington, Senator Wright was notified of the action of the convention.

Believing that a hoax had been attempted, he said: "I don't believe it's so, but if it is so, you tell them I won't run." Within 30 minutes of his nomination, Senator Wright's refusal was read to the convention.

The incredulous delegates refused to believe that the word had already reached Washington, nearly a day's journey away, and dispatched a messenger who returned the next day with confirmation in every detail of the telegraphic message.

With the impetus of this achievement, attention began to be directed toward the establishment of a trans-Atlantic cable. After numerous hardships and handicaps had been overcome, the first permanent wire linking Europe with America was successfully laid in 1866. This marked the begining of the collapse of international barriers as far as communication was concerned.

Nine years after the first Atlantic cable had been laid, Alexander Graham Bell, a teacher of the deaf in Boston, Mass., sent six words over a wire to an assistant in another room. They were: "Mr. Watson, come here; I want you." Thus for the second time in 31 years, there was another revolution in the art of communication.

Guglielmo Marconi supplied the next gasp in the record of astonishments when, in 1896, he threw off the limitations of wires and called on the ether to bear messages. Four years later his experiments had proceeded so successfully that he was able to attach an aerial to a kite in Newfoundland and receive the first signals sent across the Atlantic ocean from England. First through naval and then through commercial maritime channels, the wireless was nursed to maturity until it gave birth to radio as we know it today.

Even the visionary Marconi could scarcely foretell in the beginning the amazing uses to which this creature of his inventive brain is put today. Not only does the network of wire and the invisible wireless beam carry the human voice and the telegraphic signature around the world, but they

(*Please turn to page* 23)

Here, There and Everywhere

Indiana Bell Defends Franchise at Indianapolis

A complaint to the Indianapolis city council, that the franchise of the Indiana Bell Telephone Co. does not bring sufficient revenue to the city, brought a reply from company officials that in addition to giving the city $6,000 yearly, capable facilities for Gamewell systems of the police and fire department are provided without cost. All these facilities now are housed underground in conduits of the company.

"The telephone company will, of course, be glad to discuss the provisions of its franchise with representatives of the city," the statement concluded.

A suggestion that the telephone company may owe the city $12,000 yearly instead of the $6,000 it now pays is being investigated by the council. It is stated that when there were two telephone companies in the city they each paid $6,000 annually, but since the merger the Indiana Bell has paid only $6,000 for the same rights. Walter Boetcher, city controller, told council members the matter had come up when he was a member of the board of public works and though nothing had been done about it, he believed the utility should pay $12,000 yearly.

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Small Exchanges Exempt From Working Regulations

Official notification from the Kansas Commissioner of Labor and Industry has been received by Attorney Matt Guilfoyle that a new ruling of the commission has exempted the smaller telephone exchanges from the working hour regulations contained in their general ruling to become effective on February 15.

A meeting was had with the Kansas Corporation Commission on November 25 to discuss the difficulty the smaller rural exchanges would encounter in attempting to have their operators on duty a maximum of 48 hours per week. At that hearing Mr. Guilfoyle represented the Upland telephone system with 14 rural exchanges in the county. Walter Avery of Wakefield, secretary of the company, and E. G. Hanna, of Riley, president, also attended.

The letter, notifying Mr. Guilfoyle of the modification of the original order, stated in part:

"This order is intended to exempt all exchanges from hour regulations as to work time which do not require two or more operators at any one time for efficient service.

"We are of opinion that the individual instances where an unfair condition obtains in the small exchanges would have in many instances resulted in such additional operation costs as to make continuing operation very difficult if not impossible."

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Telephone Company Has Float in Parade

Last fall the schools of Groton, S. D., had a big "jungle day" parade, in which all the business concerns of the community were represented by floats and exhibits. One of the floats which attracted a great deal of attention was that of the Groton-Ferney Mutual Telephone Co., of which Chas. E. Adams is treasurer and general manager. Mr. Adams is also president of the South Dakota Telephone Association.

Attractive Float Entered in "Jungle Day" Parade at Groton, S. D., by the Groton-Ferney Mutual Telephone Co. A Keen Observer Will Note That the Operator, Doing Publicity Work by Means of a Loudspeaker, Is of the Masculine Gender.

As may be seen in the photographic reproduction presented on this page, the float consisted of a switchboard mounted on the company's truck, in charge of a fine-looking young operator. The latter, by the way, is one of the young men in the employ of the telephone company and not one of the company's women operators, as may be thought at first glance.

The switchboard was operated in "Grand Hotel" style. Hooked up, as it was with a loudspeaker, the operator furnished much amusement and entertainment for the crowds witnessing the parade.

On the placard just outside the truck driver's window is imprinted the name of the company. The other placard reads: "In any emergency use the telephone."

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Interesting Program for Nebraska Convention

Secretary George M. Kloidy, of Lincoln, Neb., announces completion of program arrangements for the 37th annual convention of the Nebraska Telephone association, to be held at Hastings, February 12 and 13. The morning of the first day will be devoted to registration and visits to exhibits. President D. E. McGregor will call the convention to order at 1:30 p. m. and will respond to the address of welcome that will be extended by L. B. Stiner, a prominent lawyer and a director of the Lincoln Telephone & Telegraph Co. Later Mr. McGregor will deliver his annual address.

The great increase in rural electrification that is expected to take place in Nebraska during the next few years led the directors to call upon M. T. Caster, plant superintendent of the Lincoln Telephone & Telegraph Co., to set out the problem that is serious in its implications to all telephone companies, with grounded lines particularly.

Another matter of prime importance to the telephone industry is the ramifications of the new federal Social Security Act. William I. Aitken of Lincoln (a member of the firm of Woods, Woods & Aitken, general counsel for the Lin-

coln Telephone & Telegraph Co.) who has made an intensive study of the law, will present its features and point out its connection with operators of telephone companies.

Charles C. Deering, of Des Moines, Iowa, secretary of the United States Independent Telephone Association, will discuss "Lower Insurance Rates for Rural Telephone Subscribers," setting out what the national association has accomplished along this line.

G. E. Batty, supervisor of safety for the Northwestern Bell Telephone Co., will present "Safety Aspects of Telephone Work"; O. W. Johnson, district commercial manager at Grand Island for the Northwestern Bell Telephone Co., will give an inspirational talk entitled "Full Speed Ahead for 1936."

D. W. Kingsley, president of the Central Nebraska Public Power & Irrigation district, which has headquarters at Hastings, will speak on "The Tri-County Project." This is a project that the federal government is financing to the extent of 20 million dollars, part of it an outright grant, which proposes to construct transmission lines for distribution of power.

President A. B. Clark of the Nebraska Continental Telephone Co. will conduct a round-table discussion, embracing telephone problems, as the feature of the concluding afternoon program.

The remainder of the program will be taken up with routine business, reports of officers and committees, election of new directors and naming of new committees for the year.

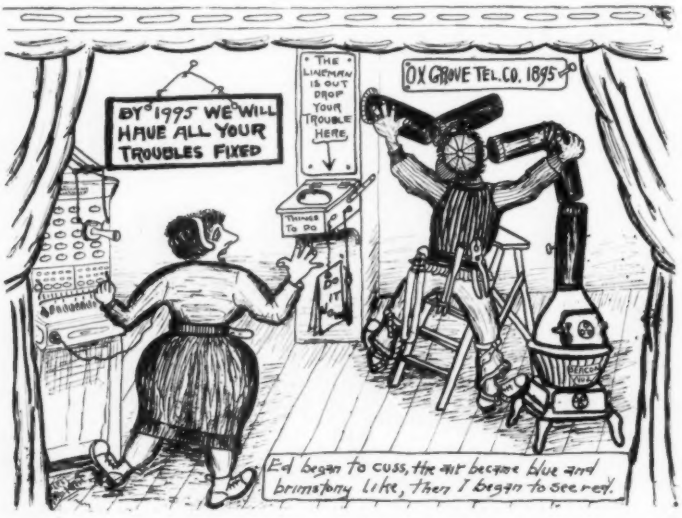
Headquarters will be at the Hotel Clarke, which has an adequate convention and banquet room. Special entertainment features will be provided for women in attendance, the convention concluding Thursday evening, February 13, with a banquet and dance.

Special Letter from Emily Schrooch

Armchair Ozarkiana,
January 18, 1936.

Dear Mr. TELEPHONY:

You may not consider me very truthful when I tell you that me and my husband have been working together in the tellafone business nigh onto 40 years and have never had but one quarrel in all that time. Of course if you don't want to publish this letter you don't have to, but I feel like you ought, if for nothing more than for the sake of a lot of tellafone operators who are at the present time figgering on marrying tellafone linemen.


BY 1995 WE WILL HAVE ALL YOUR TROUBLES FIXED
THE LINEMAN IS OUT DROP YOUR TROUBLE HERE
OX GROVE TEL. CO. 1895
THINGS TO DO
DO IT
Ed began to cuss, the air became blue and brimstony like, then I began to see red.

If you print this, you are just bound to show a lot of those girls how to get control of the situation just like I did and which is so very important especially in these days of eckonomickle recovery. Now, hoping you will go ahead and publish it, here it is just as it happened:

When my husband, Mr. Schrooch, and myself, were first married we had hired out that year to a super-rundown, 300-tellafone farmer's exchange as operator and lineman—with no help for the office, no horse to ride on for the lines, and no nothing else except what few clothes we had on our back, a pair of spurs and a Rambler bicycle. We needed a job the worst way and went after this one so hard that we got it.

The day we went to work the weather was slick, slushy, sloppy, sleety, snowy and cold. Ed was out with a satchel full of trouble tickets, racing up and down the alleys looking for lost subscribers, trying to earn his dollar per day, while I was setting there in the shivvery, clammy office with no other way to keep warm except by exercising the hand generator, listening to the code-ringing on the party lines and to the chattering of my teeth.

I had stood it about as long as I could when all of a sudden I saw Ed go racing by the office and down an alley, and, says I to myself, "Trying to please some old hayseed by getting his fone working before dinner time."

Well, before he could get out of earshot I was at the office door and hollering at him to come back and build me a fire. He never stopped going but just turned his head to one side and I heard him snort: "Build it yourself!"

I went back into the office and was standing there at one of the side windows looking out, kinda mad and disgusted like, when all of a sudden I seen him wheel around in his tracks and come slopping back toward the office as if the devil was in behind him proddin' him with a red-hot pitchfork.

Just about that time I had to go back to the switchboard to answer a call for Central. When I got through, he was there in the office poking newspapers in the stove and looking around for a match box, which he had misplaced earlier in the day firing up his mellow dramick, celloloid-lined pipe.

My husband was so tarnation mad for being interrupted while on duty that he had never even noticed, when he started to build the fire, that the stove never had any pipe on it. When I showed him where it was laying, his eyes begun to turn green and he rails out with: "Emily, why didn't you tell me you wanted me to put up a stove pipe?"

"Well," says I, "if I had told you then you never woulda come back at all."

"Well," says he, "don't stand there argyin'. Where the deuce is the step ladder?"

"Right behind you on the floor, you darn fool," says I.

Right then I had to answer some more calls and when I turned around once more, he was semi-straddle of the ladder with both feet on the floor, cussing as if his heart would break and trying to get a seven-inch pipe into a six-inch hole, which I could have done myself had the hole been bigger. His words began to grow hotter, the air all around began to sizzle, smell brimstony like and then I began to "see red."

I tore the receiver off my head, along with 40 or 50 black hairs which broke off at the roots, slammed it down on the floor, jumped on it with both feet and stomped out of the office, shouting at the top of my voice: "There's your darned old switchboard, now run it!"

My husband and myself have never "locked horns," so to speak, from that day to this. He fixed me a nice fire while I was over at the hotel getting a hot lunch, and when I got back he was answering the calls through his test

Obituaries of Two Telephone Men

HOWARD TEASDALE, Sparta, Wis., for many years prominent in Wisconsin telephone affairs, and colorful anti-vice crusader in the Wisconsin senate for 20 years died on January 11, in a San Antonio (Texas) hospital following amputation of a leg several days previous. He was enroute to his winter home in Texas when grave illness overtook him in late December resulting in the leg amputation.

Senator Teasdale was born in Janesville on August 9, 1855, but spent the greater part of his life on a farm outside Sparta. He went through the Sparta high school in two years and then worked his way through the University of Wisconsin and its law school, from which he was graduated in 1882. One of his chief part-time jobs was delivering mail to Ladies' hall, now Chadbourne hall, university women's dormitory.

He served his first state senate term in 1911 and wound up his career with a fifth four-year term in 1927 which expired in 1931. He did not seek reelection then.

His retirement from the state senate in 1931 ended a militant legislative drive against liquor, cigarets, and all forms of what he regarded as vice which he launched with his first election to the senate, 20 years before.

Mr. Teasdale was active in his community and served it for a number of years as justice of the peace, city clerk, superintendent of waterworks, city attorney, and treasurer of the school board. He was secretary and superintendent of the Monroe County Telephone Co., the Ontario & Wilton Telephone Co. and the New Cashton Telephone Co., and had been prominent in the Wisconsin State Telephone Association a number of years ago.

Besides his wife, no near relatives survive him. He leaves a niece, Mrs. C. M. Park, Madison, and a nephew, Howard Teasdale, Sparta.

COL. MALCOLM CHURCHILL RORTY, well-known telephone engineer and economist—engaged in engineering and traffic work for various Bell companies for many years following his graduation from Cornell University in 1896, later affiliated with the Bell Telephone Securities Co. and International Telephone & Telegraph Corp. and, since 1934, president of American Management Association—died January 18 in the Broad Street Hospital, New York City, N. Y., after being stricken with a heart attack at his office. He was 61 years of age.

A native of Paterson, N. J., Mr. Rorty entered the employ of the J. G. White & Co. soon after being graduated from college with a degree in mechanical and electrical engineering. From that position he went with the New York Telephone Co. In 1899 he became engineer and traffic engineer for the American Bell Telephone Co., leaving that position in 1903 to join the staff of the Central District Telephone Co., of Pittsburgh, Pa., as general superintendent of traffic.

From 1910 to 1913 he served as commercial engineer for the American Telephone & Telegraph Co., becoming assistant vice-president of the Western Union Telegraph Co. in 1913. In 1921 he was elected vice-president of the Bell Telephone Securities Co. The following year he became vice-president of the A. T. & T. Co. and a year later he became vice-president of the International Telephone & Telegraph Corp. a post which he held until 1930.

He was vice-president of the American Founders Corporation from 1930 to 1931 and became president of the American Management Association in 1934.

Among his books on economic subjects were "Some Problems in Current Economics," published in 1922, and "Bolshevism, Fascism and Capitalism—An Account of the Three Economic Systems," published in 1932.

During the World War, Mr. Rorty served as a lieutenant colonel with the ordnance department and general staff.

set. Our married life since that time has been safe, sane and serene. Ed was soundly converted that winter and since then has been no trouble to live with.

I was also converted quite awhile before we went into the tellafone business, but I just had to unravel a bit at this point just as a reminder to him of what things could be like if I should happen to really backslide. Of course, I don't mean all that but I just couldn't help saying it.

Don't fuss at me, Mr. TELEPHONY, for stringing this very personal bit of history out but I couldn't tell it in less words and make it effective. I'm a little bit like Bim Gump's mother-in-law; she bruises easy but she heals quick, while I write easy and can stop quick.

Yours respectively,
GUMVILLE TEL. & TEL. CO.,
Per Emily (Harper) Schrooch,
General Manager.

COMMUNICATION—WORLD COMMERCE

(*Concluded from page* 16)

have also been harnessed by man and made to carry pictures, facsimilies of documents, newspapers, etc. Today, contracts with signatures, notations and penciled remarks can be reproduced in London 30 minutes after they have been signed in New York City.

Thus have the urgencies of intercourse subdued the universe. Today a business man can converse with his office from a steamship in mid-ocean. Pilots of speeding airliners send and receive weather information from aloft. Prodigious distances are spanned by the telephone. A manufacturer in the United States secures an order by telephoning a customer in the Philippines, 12,000 miles away. Jungle trading outposts too remote for telephone lines or roads, converse freely with the home office on the other side of the world by radio.

The complete breakdown of isolation which has followed the development of communication facilities has been of incalculable value to mankind. Whether the ultimate in the art of communication has yet been reached, no one can say. Many believe it has not.

One fact stands out, however: Increased trade has gone hand in hand with speedier communication and transportation. And it is hard to conceive of speedier communication facilities than those in existence today which make it possible to send a voice around the world in one fourth of a second.

Commission And Court Activities

FCC Chairman Answers Questions on Broadcasting

Chairman Anning S. Prall of the Federal Communications Commission, on January 15, said the commission regards orders by the Federal Trade Commission affecting radio programs as an "important consideration" in applications for renewals of broadcasting licenses.

Mr. Prall replied to questions from Representative Wigglesworth, Democrat of Massachusetts, who had asked what steps the FCC took to procure compliance with the Federal Trade Commission's "cease and desist" orders against radio programs. He said orders of the FTC are carefully reviewed to determine whether continued operation of any radio station would be in the public interest.

Mr. Wigglesworth asked whether the commission planned any further investigation of an assertedly "obscene" broadcast from Mexico last spring. He was told it did not, as nothing "which could be determined 'obscene' under the provisions of the Communications Act" had been heard.

Mr. Prall said there was no foundation "for the assertion" that the commission issued a broadcasting license without cost to a station which later concluded a ten-year lease "calling for a payment of several million dollars."

▼ ▼

Radio Communications Duplication Before FCC

The question of whether control of world-wide radio-telegraph service would pass out of the hands of the United States if the Mackay Radio & Telegraph Co., Inc., were permitted to duplicate in many instances the foreign services of RCA Communications, Inc., was brought before the Federal Communications Commission last week in hearings on a petition of Mackay Radio to add Oslo, Norway, to its service as a point of radio communication.

The FCC, on January 14, unexpectedly disclosed through Commissioner Irvin Stewart, conducting the hearings, that it regarded this as a policy case for the commission.

Ellery W. Stone, operating vice-president of the Mackay company, told the commission that his organization would like to establish far-flung radio-telegraph services which allegedly would conflict in many cases with those of RCA.

He testified concerning what he termed "the monopolistic position" of the Radio Corp. of America. His testimony was challenged as "pure demagogy" by Frank W. Wozencroft, RCA counsel, who asserted that his company had received no intimation that the hearing would deal with a situation covering the globe.

Chairman Stewart of the telegraph division of the FCC, later said:

"The chair agrees that this hearing may have something to do with the establishment of a policy by this commission. The commission has no desire to try to establish a policy without considering history."

▼ ▼

House Resolution Calls for FCC Investigation

A resolution calling for an investigation of the Federal Communications Commission was offered to the House on January 15 by Representative William P. Connery (Dem., Mass.), chairman of the House labor committee. Mr. Connery charged that the commission played with the big radio broadcasting companies and discriminated against the small ones.

Minority Leader Bertrand Snell of New York declared that the Republicans would be behind Representative Connery's resolution and would press for the investigation. Mr. Snell said that there was a definite feeling in the House that radio chains had been unfair in dividing time between the two major political parties.

It was predicted that the resolution will get no farther than the rules committee, to which it was referred. The Democratic leadership is expected to try to keep it from even reaching the floor of the House.

Republican resentment at the methods of allotting political time by the big chains, on the other hand, may make it possible that a majority of the House will sign a petition discharging the rules committee from consideration of the bill.

The resolution recites again the charges made by Mr. Connery last year in connection with what he termed an obscene broadcast made by the Mexican Government over the NBC system. It mentions charges that the great chains are monopolizing the wave lengths, and notes the investigation now being carried on by the Federal Communications Commission itself (TELEPHONY of January 18) into charges against one of its members.

In a speech on the floor of the House January 15, Mr. Connery asserted that the big chains were denying an opportunity to speak to labor, religious and veterans' organizations.

▼ ▼

Challenges Right to Return on Unused Plant

The right of the Pacific Telephone & Telegraph Co. to claim a return on property in excess of what is absolutely necessary to perform service for its customers was challenged by Alfred P. Dobson, attorney for the Oregon Public Utilities Commission, when arguments in the telephone rate case were resumed January 15 before Circuit Judges Tucker, Lusk and James T. Brand of Marshfield, sitting en banc.

The telephone company is seeking to have set aside an order reducing its exchange rates, made by former Commissioner Charles M. Thomas.

Attorney Dobson contended that the telephone company has a plant adequate to serve a total of 150,000 customers in the state and that in 1932 (the time on which the figures for rate-making purposes were based) it had only 110,000 customers.

He contended that the commissioner was right in eliminating $5,221,000 from the value of the company's plant for rate-making purposes, on the ground that it represented excess and overabundant plant. Mr. Dobson also contended that the company in figuring valuation of its plant included excess labor and overhead costs amounting to approximately $3,000,000.

▼ ▼

Urges 10 Per Cent Rate Cut in Wisconsin Case

In opening final arguments, on January 20, in the investigation of the Wisconsin Telephone Co. by the Wisconsin Public Service Commission, Alvin C. Reis, chief counsel for the commission, recommended a permanent reduction of 10 per cent in the company's rates. This, he estimated, would reduce the company's income by $1,000,000. Mr. Reis explained that this reduction was figured on a net rate base of $33,000,000. Continuing, he declared that the engineering data developed by the commission staff members would have warranted a larger reduction, but less controversy was expected to result by sticking close to legal grounds.

The commission's counsel recommended, however, that the commission stand firm on four differences between findings of its staff and that of the company in appraising the property. Deductions

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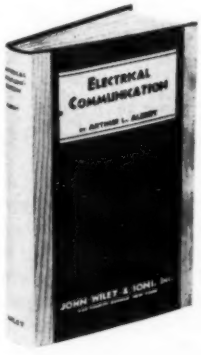

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for depreciation of property doubtless is "the paramount issue," Mr. Reis asserted, recommending that the commission deduct $13,000,000 or 28.6 per cent of the book value of the company's 96 exchanges for depreciation.

The four differences he urged the commission to stand by are: Its computation of the price for materials and equipment at $3,900,000 less than that of the company's staff; its decision that the company men figured $500,000 too much for interest during construction; its decision that the company allowed $400,000 too much for omissions and possible errors in appraisal; and its computation of company payments for wages at $600,000 less than the company staff claimed.

The company has $4,000,000 invested in plant that it does not use, Mr. Reis contended, while an additional $3,500,000 of long distance property should be combed out of that figured into the rate base.

The commission can avoid controversy by accepting, at least temporarily, company figures on some of the most disputed engineering items, he said.

▼ ▼

Wire to Be Used on Railroad Crossings

The work of elimination of railroad crossings in Nebraska has called for renewed activities on the part of the joint committee created some years ago in that state to take care of relations between electrical supply and signal lines; but it is believed that the revised rules adopted last May and approved by the Nebraska State Railway Commission will cover all of the new situations that will arise in the way of reconstruction.

M. T. Caster, representative on the committee of the Nebraska Telephone Association, has recently been investigating the matter of wires that may be used in crossing work. He says that iron wire is not permitted under the rules now in force, but that telephone men have the wrong conception of what constitutes iron wire.

He is advised by wire manufacturers that what are known as "BB" and "steel" wires do not come within the prohibition, and that either will meet the specifications covering crossing spans. In the work of manufacturing this wire, enough carbon is added to the iron element to make it actually steel, sufficient being added in appreciable amounts to take these types of wire out of the classification and, therefore, permissible to be used for crossing work because of the added tensile strength.

Answers to Questions Presented on Page 15

1. If messenger service were required because the called station was out of order and a particular person was not specified, the call is subject to a messenger charge but the station-to-station rate will apply on the call. In all other cases, messenger calls are subject to the person-to-person rate.
2. The answer will be found in the introduction to this series of questions and answers.
3. Give the report to the calling station, saying, for example: "Mr. Hill has a telephone at 123 Main Street but he has requested us not to give out his number. Unless you furnish the number, I cannot connect you."
4. No.
5. If the called number is busy on a call to a direct circuit point, the circuit should *not* be held. Attempts should be made to reach the called number at approximately three minutes from the receipt of the first report and if necessary, make a third and fourth attempt at the end of about six and nine minutes, respectively.

▼ ▼

Reorganization Asked Under Bankruptcy Act

The United Telephone & Electric Co., a Delaware corporation and a holding company, on January 9 asked the United States District Court in Wilmington, Del., for permission to reorganize under section 77-B of the federal bankruptcy act.

The company said in its petition that among its assets are securities with a book value of $11,380,503 and that its liabilities, as of October, 1935, amount to $1,400,000.

The petition asserted the company is not insolvent, but that it is unable to meet maturing obligations and outstanding demand notes. Judge John P. Nields set February 1 as the date for a hearing.

▼ ▼

Investigation of Service in Virgil, N. Y.

An investigation has been instituted by the New York Public Service Commission as to the telephone service provided in the town of Virgil, Cortland County, and as to whether to promote the convenience of the public it is necessary that the New York Telephone Co. extend its service into the town. A hearing will be held in Virgil on Tuesday, February 4, at 10 a. m.

The investigation was ordered, on the commission's own motion, after a petition had been received from 45 residents of Virgil stating that they are desirous of telephone service from the Cortland exchange of the New York Telephone Co. At present Virgil is served by the Dryden Telephone Co., which also operates an exchange at Dryden.

The Virgil exchange has 63 subscribers, of which 21 signed the petition, the remaining signers being non-subscribers. A reply to the complaint made by the Dryden company was accompanied by a petition signed by 47 of the 63 Virgil subscribers requesting the Dryden company to continue the present service arrangement. The names of many subscribers appeared on both petitions.

The Dryden company has recently rebuilt its outside plant and constructed a small central office building in Virgil in anticipation of converting the exchange to dial operation. The dial switchboard has been received but its installation is being held up pending the settlement of the question raised by the petition sent to the commission by the residents of Virgil. The New York Telephone Co. replied to the complaint, setting forth its reluctance to invade the territory of Independent companies.

There is a 10-cent toll charge between Virgil and Cortland; Virgil subscribers may call Dryden and Freeville of the George Junior Republic Telephone Association without toll charge. Normally, if Virgil subscribers were served from Cortland there would be a 15-cent toll charge on their calls to Dryden and on Dryden calls to subscribers in Virgil. A check of calls made for one month showed that 98 per cent of Cortland subscribers did not call Virgil and that 49 per cent of Virgil subscribers made no calls to Cortland and that 82 per cent of the subscribers did not make over two calls.

▼ ▼

Higher Rates Approved for Common Battery Service

The Northwestern Bell Telephone Co. is authorized, in an order handed down December 31 by the South Dakota Board of Railroad Commissioners, to increase its monthly rates in the city of Sturgis to the following schedule, upon the completion of a common battery plant and the installation of common battery telephone service:

Business one-party	$4.00
Business two-party	3.25
Residence one-party	2.75
Residence two-party	2.25
Residence four-party	2.00

The rates for residence service are gross rates, subject to discount of 25 cents if the bill is paid within the period discount is allowed.

The application was accompanied by formal resolutions passed by the city council of Sturgis and the directors of the Sturgis Commercial Club, and petitions signed by 92 per cent of the present subscribers of the company, requesting that the present magneto exchange be converted to a common battery system and that a new building be constructed, the petitioners agreeing to pay the proposed rates.

Having given consideration to the additional investment in plant which will be necessary and unavoidable if and when the plant is converted to a common battery system, the commissioners reached the conclusion that the proposed rates, if applied to the present volume of business, would not produce an unreasonable return upon the increased investment in plant, and that the proposed rates are not out of line, when compared with rates in effect for like type of service in other cities similarly situated.

▼ ▼

Tri-State to Buy Redwood Falls Electric Co.

The Minnesota Railroad & Warehouse Commission, on December 12, authorized the Tri-State Telephone & Telegraph Co. to purchase and the Redwood Falls Electric Co. to sell to the former all of its assets of every kind and nature located in the city of Redwood Falls.

The commission specifies that nothing in its order shall be construed as an approval of any increase or change in rates or diminution of service in the territory served.

After hearing the evidence in this proceeding, the commission found that all of the outstanding stock of the Redwood Falls Electric Co. is owned by the Tri-State company; that it desires to consolidate the toll property it operates at Redwood Falls with the local exchange for the purpose of increased operating efficiency and effecting economies in operating and accounting.

▼ ▼

Telephone Properties at Murdock, Minn., Sold

The Minnesota Railroad & Warehouse Commission has approved the joint application of E. B. Peterson for permission to sell the Murdock Central Telephone Exchange Co. and of the Kerkhoven Telephone Co. to purchase the Murdock Central company properties located at Murdock, Swift County, Minnesota. Further permission was granted the Kerkhoven Telephone Co. to change its name to Kerkhoven & Murdock Telephone Co.

It was claimed that the merger of the two companies would simplify the work of keeping books and records, thereby effecting economies in operation.

▼ ▼

Commission Upheld in Toll Line Controversy

The Virginia Supreme Court of Appeals recently upheld the state corporation commission in the case brought by the Chesapeake & Potomac Telephone Co. against W. W. Gibbs, who is operating the Roanoke & Botetourt Telephone Co., under lease, and is president of a number of other telephone companies operating in the vicinity of Roanoke.

Although denying the petitioner's requests that Mr. Gibbs be prohibited from making improvements essential to adequate service on the line from Clifton Forge to a point near Roanoke, by way of Eagle Rock and Fincastle, the commission ordered the defendants to desist from making a toll connection between Clifton Forge and Lexington and between Lexington and Waynesboro. The construction of such toll lines, the commission held, would parallel existing lines and duplicate the service now rendered by the Chesapeake & Potomac company.

The court held that the commission's action was not a taking of private property without compensation, or without due process of law, or a deprivation of equal protection of law. It upheld the constitutionality of the statute authorizing the commission to prohibit a paralleling of lines, if in its judgment efficiency of service by either company or public convenience will be injuriously affected. The court held to be sound the commission's interpretation of the word "paralleling" as not necessarily meaning "physically" paralleling.

With regard to Clifton Forge-Roanoke line, via Eagle Rock and Fincastle, the evidence reveals the fact that this line has been operated for more than 30 years by the Roanoke and Botetourt company, although such calls are admitted not to be entirely satisfactory, and that the line is and has been for a number of years practically paralleled by the Chesapeake & Potomac company which rendered long distance service from Roanoke to Covington. The commission, therefore, held that it was without jurisdiction to prevent the company, or its lessee from making improvements essential to adequate service.

▼ ▼

Dial Service, Increased Rates for Greenwood, S. C.

The South Carolina Public Service Commission has authorized the Greenwood Telephone Co. to install an automatic telephone system in that city and

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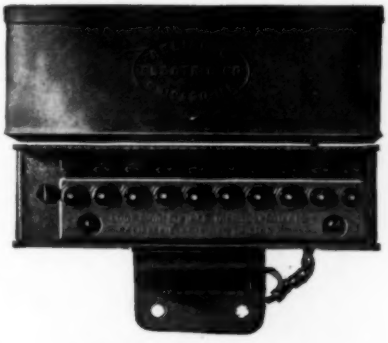

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to make certain provisions in the subscription rates for users, Ben J. Perman, chairman of the commission, has announced.

The authorization was given upon presentation of the petition of 580 subscribers, said to represent 1,032 of the 1,300 telephone stations in Greenwood.

The rates will be increased as follows: One-party business rate, from $3.75 per month to $5 per month; and the two-party business rate from $3.50 per month to $3.75 per month.

▼ ▼

Commission Rulings and Schedule of Hearings

Federal Communications Commission Washington, D. C.

January 11: Telephone Division granted special permission to the American Telephone & Telegraph Co. to establish overseas telephone service at regularly filed rates to the S. S. Reliance, effective January 13, 1936.

January 15: Telephone Division granted the Champaign Telephone Co., Urbana, Ohio, 30 days to file complete responses to orders Nos. 1, 2, 3, 5, 6A and 9. If the company fails to comply, a hearing will be held, the scope of which shall include "in addition to the question of control, any and all facts and matters relevant to the extent of this jurisdiction over the Champaign Telephone Co., including the furnishing of facilities and services, if any, to broadcasting stations for broadcast purposes."

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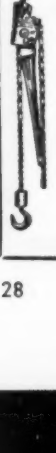

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Illinois Commerce Commission

January 14: Because of the expense of fighting the commission's order, restraining them from passing on the state's 3 per cent occupational sales tax to their customers, five downstate telephone companies withdrew petitions for rate increases to cover the tax. The companies notifying the commission of this decision are Illinois Central Telephone Co., Illinois Valley Telephone Co., Illinois Telephone Co., Wabash Telephone Co., and Automatic Home Telephone Co.

January 21: Hearing in Springfield on proposed change in rates of the La-Motte Co-Operative Telephone Co. for telephone service stated in schedule I. C. C. No. 2 original sheet No. 9 rendered by the company.

January 22: Hearing in Springfield on application of the Southeast Missouri Telephone Co. for authority to keep the general books and records pertaining to its exchanges at Olive Branch, Tamms and Thebes, Ill., at the company's headquarters at Cape Girardeau, Mo.

January 22: Hearing in Springfield on application of the Southwestern Bell Telephone Co. for an order exempting it from the provisions of general order No. 140 and authorizing it to keep its books and accounts outside of Illinois.

January 24: Hearing in Chicago on complaint of the Clearing Industrial Association, et al., against the Illinois Bell Telephone Co., as to unjust and unreasonable charges for telephone service by the Illinois Bell to complainants in the Chicago exchange area.

January 27: Hearing to determine whether Illinois Bell Telephone Co. rates are equitable. The Illinois Bell company has pending a petition for a 3 per cent rate increase to offset the utilities sales tax, while the commission at the same time has called upon the utility to show cause why its rates should not be reduced. Attorney Harry R. Booth, of the commission, said both rate questions will be covered.

Indiana Public Service Commission

January 17: Petition filed by the Citizens Independent Telephone Co., Terre Haute, for authority to issue $1,450,000 in first mortgage 4½ per cent 25-year sinking fund bonds. Proceeds would be used to retire $1,445,000 of preferred stock, the petition stated. The company claimed its patrons would benefit from the issue because of a $37,000 annual saving in capital expenses.

Missouri Public Service Commission

January 11: Order issued dismissing complaint of Hunsicker Bros. against J. C. Ray, manager of the Home Telephone Co. at Bethany.

January 13: Joint application filed by The Western Telephone Corp. of Missouri to sell and Lillie Mae Nelson to purchase the telephone exchanges located at Durham and Maywood.

January 14: Order issued approving application of the Southeast Missouri Telephone Co. to file a rate schedule for common battery telephone service at Hayti, Pemiscot County.

January 15: Joint application filed by The Western Telephone Corp. of Missouri to convey and the Independent Telephone Co. to accept the outside plant of exchange at Williamstown.

Nebraska State Railway Commission

January 8: Request granted of the Northwestern Bell Telephone Co., of Omaha, for an indefinite postponement of the hearing—originally scheduled for January 15—on the proposed 1936 depreciation rate of the company.

January 15: In the matter of the application of the Oakdale Telephone Co. for authority to waive installation charges for the year 1936; it appearing that the request is reasonable, ordered that authority be granted as asked.

January 15: In the matter of the application of the Tri-County Telephone Co. of Wolbach for authority to issue stock for the purpose of financing the purchase of the plant; it appearing that the request is reasonable, ordered that securities in the sum of $8,000 be authorized.

January 15: Complaint filed by Mrs. Rae C. Williams against Northwestern Bell Telephone Co. alleging improper disconnection.

January 15: Complaint filed by Harry Michaelson, of Columbus, against Nebraska Continental Telephone Co., alleging that action of company in discontinuing service because of non-payment of toll bill of $6.30, incurred by transient guests who fled without paying their account, not justified under circumstances; dispute as to whether long distance service was furnished with assent of night clerk.

New York Public Service Commission

February 4: Hearing in Virgil in the commission's investigation of the telephone service provided in the town of Virgil, Cortland county, and as to whether the New York Telephone Co. should extend its service into the town for the convenience of the public. The town is at present served by the Dryden Telephone Co., which also operated an exchange at Dryden, N. Y.

Ohio Public Utilities Commission

January 15: On the petition of both parties, the commission, with disclaimer of being bound in any future proceeding challenging the reasonableness or justness of the rates, approved the toll interchange agreement dated November 12, 1931, between the Logan Home Telephone Co. and the Ohio Bell Telephone Co., and provided that all future modifications thereof be promptly submitted.

Pennsylvania Public Service Commission

December 31: The Pennsylvania Telephone Corp. on this date acquired title to the Buckstown & Allegheny Telephone Co., which transfer was approved by the commission. The line serves subscribers at Stoyestown, Lambertsville, Shanksville and Buckstown, all in Somerset County.

Washington Department of Public Works

January 3: Pacific Telephone & Telegraph Co. filed rate revisions affecting intrastate and interstate long distance calls and reducing the handset rate of 25 cents to 15 cents per month. The two-minute initial period for long distance calls was lengthened to three minutes. The new schedules were effective January 15.

Wisconsin Public Service Commission

January 20: In opening final arguments in the Wisconsin Telephone Co. rate case, Alvin C. Reis, commission's chief counsel, recommended a permanent reduction of 10 per cent in the company's rates.

Condensed Telephone News

Telephones

CHICAGO, ILL.—Final figures for telephones in Chicago at the end of December show a total of 849,889, compared with 846,967 at the end of the preceding month and 824,293 a year ago, the Illinois Bell Telephone Co. has announced. The total for Illinois was 1,228,262, against 1,223,971 on November 30, and 1,191,936 on December 31, 1934.

NEW YORK, N. Y.—The General Telephone Corp. (formerly the Associated Telephone Utilities Co.) reports that its subsidiary operating companies showed a total gain in company-owned stations last year of 11,874 over the total at the beginning of the year. In 1934 a gain of 1.64 per cent was recorded.

NEW YORK, N. Y.—New York Telephone Co. in 1935 had an estimated gain of 23,000 telephones, James L. Kilpatrick, president, stated in a recent communication to the stockholders. This would compare with a net increase of 630 in 1934, the first year since 1929 to show an increase.

For the first two weeks of 1936 the company reports a net gain of 1,742 telephones, comparing with losses of 1,619 and 645 telephones respectively, in the corresponding periods of 1935 and 1934. The rise was the first for the period in more than four years.

DURHAM, N. C.—The Durham Telephone Co. reports a net gain of 279 telephones during 1935, bringing the total as of December 31, 1935, up to 6,391. E. H. Danner, general superintendent of the company, states that considerable improvements were effected during the past year in the company's facilities, including the extension of the Chapel Hill road line to the Orange county line, a distance of four miles, the rebuilding of a section of pole line of West Trinity avenue, in Durham, and the installation of modern P. B. X. systems for three of that city's business concerns.

CINCINNATI, OHIO.—The Cincinnati & Suburban Bell Telephone Co. reports a gain of 522 telephones for December and a net gain of 7,489 for the whole of 1935. At the year's end, 156,447 stations were in operation.

COLUMBUS, OHIO.—With a total of 65,960 telephones in use in Columbus at the end of 1935, the Ohio Bell Telephone Co. has recovered nearly 38 per cent of the losses in this city that were brought about by the economic depression, although it still has some distance to travel before regaining its peak reached in April of 1930, when there were 76,788 telephones in use.

The net gain in Columbus for 1935 was 3,433 telephones which represents the difference between the new installations and the removals.

ZANESVILLE, OHIO.—The Ohio Bell Telephone Co. reports a net gain of 212 telephones in its Zanesville exchange during 1935, or a total of 7230 telephones as compared with the all-time high of 9683, reached in April, 1930.

ANTIGO, WIS.—The Langlade Telephone Co. had an increase of 102 telephones last year, making a total of 2200 served at the end of the year. There are 400 farm line patrons of 22 mutual organizations who have connection with the city subscribers through the switchboard of the Langlade company.

During the last two years there have been installed in the city of Antigo, five private branch exchanges. One was installed in the McMillan hotel and placed in service early this month. This development is rather unusual in cities of like size to Antigo.

DALLAS, TEXAS.—Telephones in Dallas on January 1 totaled 74,234, only 123 short of the record set in April, 1931, Southwestern Bell officials have reported to Utility Supervisor Joseph Leopold.

Financial

TERRE HAUTE, IND.—Officials of the Citizens Independent Telephone Co. have filed papers with the Indiana secretary of state showing a reorganization of the company with 3,000 shares of capital stock having a par value of $50 a share.

DALTON, MINN.—The Park Region Mutual Telephone Co. has issued its financial report for the year ending December 31, 1935. It shows total receipts for the year of $5,863.23. Adding $220.80, cash on hand as of January 1, 1935, the grand total of receipts amounted to $6,084.77, leaving $7.26 cash on hand as of January 1, 1936. Of the disbursements, $1,522 were expended in paying operators' salaries.

The company operates a total of 535 telephones. Of this number 445 are "share" telephones and 87 are rental telephones. During 1935 connections were made for a total of 5,416 long distance messages. The officers and directors are as follows: N. P. Jensen, president; H. P. Nelson, vice-president; H. M. Gronner, treasurer; Henry G. Hoff, secretary; directors, P. Brandvold, Albert Haarstad, Elof Hagen, Oliver Skindrud and L. A. Boe.

GRANITE FALLS, MINN.—The financial statement of the Granite Falls Telephone Co. for 1935 shows total assets of $56,988.99 and total liabilities of $55,280.30, a net gain for the year of $1,708.69.

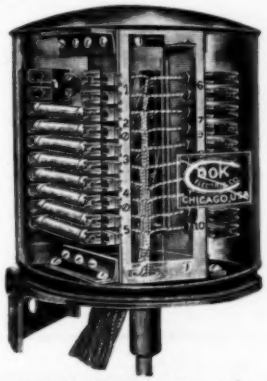
The total income of $12,843.81 is made up of these items: Rental from subscribers, $10,815; toll commissions from Tri-State company, $1,391; tolls accrued on own lines, $473; revenue from directory issue, $164. Among the larger items which go to make up the $11,134 in total expenditures are: Taxes, $877; repairs on wire plant, $1,321; repairs on equipment, $686; operators' wages, $2,724; general office salaries, $2,000; insurance, $380; rent, light and heat, $677; depreciation for year, $1,100.

The stockholders of the company, at their annual meeting, voted a 6 per cent dividend on common stock and re-elected for a three-year term two directors whose terms had expired, namely, G. L. Wilder, manager of the company, and P. G. Sheimo, its secretary.

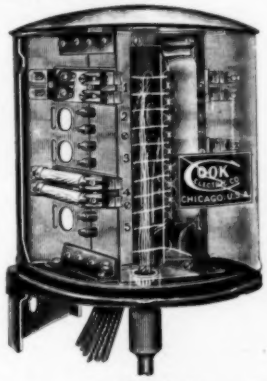
The Granite Falls company is now furnishing common battery service to 441 subscribers in the city of Granite Falls and magneto service to 143 rural subscribers over 19 full metallic rural circuits. A net gain of 23 telephones for the year is reported.

COOK

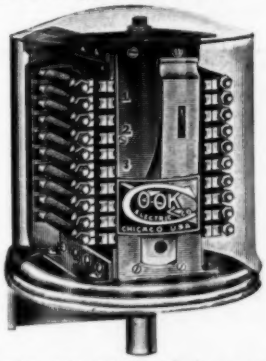
protected terminals are recognized throughout the world because they have proven satisfactory in the past and are improved for the future.



These terminals provide every modern, desirable, practicable feature with the assurance of satisfactory service.



There are no experiments in, or to these terminals, nothing that has not been tried, and tested for years in the field.



Cook S-6 with full length fuses and non-grounding arresters.
Cook S-16-D with demountable protector mounts.
Cook S-7-A with screw type fuses and non-grounding arresters.

FOR YOUR PROTECTION SPECIFY COOK

Cook Electric Company

CHICAGO

"Telephony's" Engineering Data

By B. C. BURDEN

Index, Pole Line Construction.
January 25, 1936.
No. 14-B, Page 10.

The guy should be fastened to a point above or below the messenger, preferably the former. An alternative method is to place an insulator in the down guy to secure the required electrical separation. The two methods of insulating the down guy from foreign currents in the messenger are illustrated in Figs. 11B and 13.

Pulling Up Down Guys

In order to fasten a down guy to an anchor, some mechanical means of tightening the guy is needed. There are several such methods—block and tackle, ratchet hoist, and guy stretcher. Anyone of them will do the job satisfactorily, but the use of a hoist or guy stretcher makes the work considerably easier and requires less time.

The method of pulling up and attaching the down guy is described as follows: An ordinary guy clamp, equipped with a heavy iron ring in the third bolt hole, is fastened a sufficient distance up the guy strand to permit the placing of the pulling device. An auxiliary wire, composed of a short length of wire or strand, is attached to the eye of the anchor rod and provided with another temporary clamp. The pulling device is then fastened to the clamps and operated to draw the clamps together.

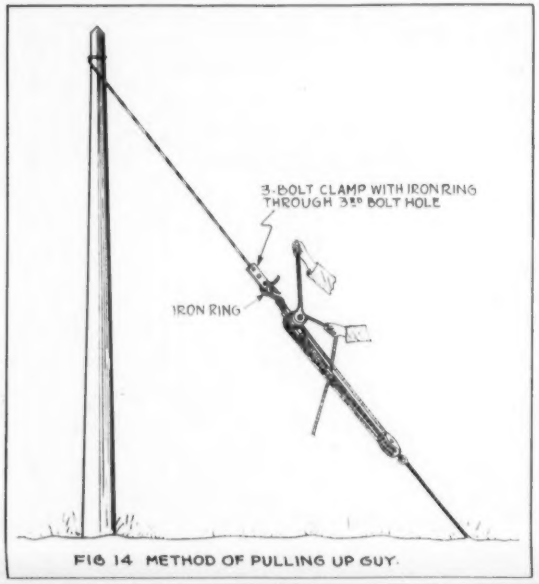


FIG 14 METHOD OF PULLING UP GUY.

"Telephony's" Engineering Data

By B. C. BURDEN

Index Pole Line Construction.
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When the pole begins to bend back at the top, the operation is stopped. The free end of the guy is then threaded through the eye of the anchor rod and bent back on itself. A guy clamp is bolted over the looped strand, forced down to within several inches of the eye, and tightened; if needed, another guy clamp is attached just above the first one.

The pulling device is then slacked off and removed, together with the clamps. Fig. 14 illustrates the method. (Note: Strand grips of the proper size may be used in place of the pulling clamps.)

The important point in pulling up a down guy is to place sufficient tension on the strand so that the anchor will set. If this is done, there will be less danger of the guy ultimately sagging and allowing the pole to assume the strain. Of course, by tightening the guy, the pole is subjected to some fiber stress but this will be compensated for when the cable or aerial lead is installed on the pole.

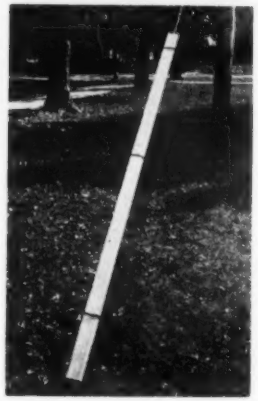


Fig. 15. Guy Guard (Hughes) Having High Visibility.

Guy Wire Guards

Unprotected down guys in exposed locations are a source of danger to people and vehicles. They have frequently been the basis of damage suits, even when the guys were located in relatively inaccessible positions as to require persons going out of their way to collide with them. The solution is to utilize wire guards made of metal or wood. These serve as a warning of the presence of a guy and, in cases of actual collision, reduce the damage that might result were the guard not in place.

In rural districts, use can be made of old crossarms or iron pipe of sufficient length to cover the clamp at the anchor and extend six to eight feet up the guy.

In towns and on the more traveled highways, good appearance of the guy guard, as well as better visibility, becomes an important factor. Guards made especially for such locations are available from telephone supply houses. Fig. 15 shows a standard type of guy guard which has high visibility and is easily installed.

Safety rules require that strain insulators be placed in both down guys and overhead guys where either are located in such position that they might come in contact with power wires carrying voltages above 220 volts. Strain insulators in down guys should be placed at least eight feet from the ground.

"Telephony's" Engineering Data

By B. C. BURDEN

Index, Transmission Data.
January 25, 1936.
No. 15-A, Page 1.

Interesting Facts About the Decibel

Many have difficulty in understanding the decibel due to the fact that it is a unit which does not of itself have quantitative significance. The decibel defines the ratio in which two quantities may differ from each other. In order that the decibel might be used to express the magnitude of power, voltage, or current level at any point in an electrical circuit a *zero reference level* was established to which power levels could be referred and thus a ratio obtained which, when converted to decibels, would enable the expression of power levels in terms of the db.

Standard Reference Level in General Use

The zero reference level in most general use is 0.006 watt. This value was selected because it represents the approximate output of the average telephone. Inasmuch as the leading telephone laboratories were responsible for the establishment of the decibel, it is natural that the zero reference point should be the output of some common piece of telephone apparatus.

To illustrate how the output of amplifiers, the power level on telephone lines, etc., can be expressed quantitatively in terms of the db, let us consider several typical cases. Assume we have a 6.0 watt public address amplifier, the output of which we wish to express in decibels. We may find the output in decibels by merely taking the ratio of 6.0/.006 watts, which is 1000.

From our table of power ratios vs. db, we find that a power ratio of 1000 corresponds to 30 decibels; hence we say that the output of the amplifier is plus 30 (+ 30 db).

If we know the power output of the amplifier in decibels and wish to convert this to watts, we would find the corresponding power ratio; and by multiplying this by the zero reference power of 0.006 watt, we would get the actual power in watts.

Direct Reading DB Meters

Instruments are available which permit measuring power levels on direct-reading decibel scales. These instruments are merely rectifier type alternating-current voltmeters with the dial calibrated to read in decibels rather than in volts. With instruments of this type it is necessary that they be either used on circuits of the same impedance as that which the instrument is designed for, or that a correction factor be applied to the reading obtained.

Most of these instruments are calibrated for use on 500-ohm lines. The calibration is based on the following relationship:

$$\text{db} = 10 \log \left(\frac{E^2}{Z} \right) \Big/ .006$$

where E = any voltage reading; Z = impedance for which instrument is designed.

On a 500-ohm line zero reference level is 1.73 volts.

The Manufacturers' Department

Automatic Electric's Central Battery Line Adapter

A new and effective device for providing central battery service from magneto exchanges was recently announced by American Automatic Electric Sales Co., distributor for products of Automatic Electric Co., Chicago.

View of Autelco Central Battery Line Adapter for Providing Magneto Exchange Line with Central Battery Telephone Service.

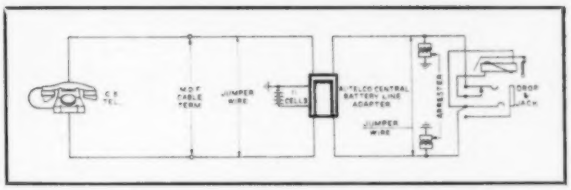
This device, known as the Autelco central battery line adapter, is essentially a compact transformer, of special patented design. Each line to be converted to central battery operation is equipped with an adapter which is connected in the line circuit at the central office.

A 24-volt storage battery, connected through the primary windings of the adapters, provides the central battery current supply for all of the central battery lines. Current induced in the secondary winding of the transformer serves to operate the drop signal when the telephone handset is removed from, or replaced on, the cradle.

The adapter serves as a ring-through and talk-through repeating coil on incoming signals and on voice transmission. Any standard types of central battery telephones can be used in connection with this new device.

While operating companies are finding the greatest use for this adapter on individual lines, it may also be used on party lines serving up to ten stations. It may be used on any full-metallic circuit, with an allowable loop resistance of 700 ohms, and using straight line or harmonic ringers. No changes are required in the switchboard, nor in those lines which are to be continued on a magneto basis.

Schematic Diagram Showing Connection of Adapter to Line Circuit.



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Dial Service for Minnesota Exchanges

The North Star Telephone Co., with headquarters at Mountain Lake, Minn., recently installed North "All-Relay" dial-automatic equipment in its Odin and Butterfield exchanges. The subscribers of these exchanges are now provided with modern telephone service such as is furnished in the larger cities.

Butterfield and Odin are operated as completely unattended automatic units, with the general offices and information services centered at the North Star Telephone Co.'s Mountain Lake exchange. The long distance toll connections for both these exchanges are handled through the Windom exchange of the Tri-State Telephone & Telegraph Co.

Butterfield subscribers obtain toll connections by dialing "60," which connects them to the toll operator at the Windom office. The Butterfield subscribers are able to dial Odin subscribers directly by first dialing "40," and then dialing the Odin subscriber's directory number.

Odin subscribers are able to dial the subscribers at Butterfield by first dialing "0," and then dialing the Butterfield subscriber's number. In order to obtain information service, the Odin subscribers must dial "0" "0." The dialing of the first "0" connects them through to the Butterfield exchange. Dialing the second "0" has the same effect as if a local Butterfield subscriber had dialed "0", and the calling party is immediately connected to the information operator at the Mountain Lake exchange.

Crapo GALVANIZED PRODUCTS

Crapo Galvanized — Indiana Steel & Wire Co. — Muncie, Ind.

Line Gangs Know from Actual Experience

MEN in the field recognize the outstanding advantages of *Crapo* Galvanized Telephone Wire and Steel Strand. They know from experience that these dependable products can be spliced without injury to the heavy, *pure* zinc galvanized coating; that they are easily and quickly served; that they last longer in actual service under all conditions. For long life and low maintenance costs, specify genuine *Crapo* Galvanized Wire and Strand on all new and replacement jobs! Their superiority in actual service is a matter of record in the engineering offices of some of America's leading public service companies.

Indiana Steel & Wire Company

Muncie, Indiana

Telephone and Telegraph Wire

• • •

Steel Strand

In a similar manner the Odin subscribers obtain their long distance connections by dialing "0" "60," which connects them through to the toll operator at the Windom office.

The new equipment at Butterfield consists of a 100-line capacity North "All-Relay" switchboard equipped initially with 90 lines and eight links. The equipment is arranged to serve both grounded and metallic lines and at the present time there are 83 metallic lines and seven grounded lines in service.

The Odin exchange is the smaller of the two equipments and is a 60-line capacity North "All-Relay" switchboard equipped with 50 lines, of which 39 are metallic circuits and 11 are grounded.

These new switchboards have incorporated in them the line lock-out feature which automatically locks "shorted" lines, or lines in trouble of any kind, out of the central office equipment until the trouble on these lines is cleared, when they are automatically restored to service.

In addition, these switchboards have the North company's new self-regulating battery charger built into them as a part of their standard equipment. This battery-charging equipment is of the new automatic self-regulating type recently developed by the North company and contains no moving parts, bulbs, liquids or contacts. This charging unit, in common with the "All-Relay" switchboard, it is stated, requires absolutely no routine testing or maintenance.

Obituary

Robert F. Freeman, general manager of Fibre Conduits, Canada, Ltd, Cornwall, Ont., died suddenly in Montreal on January 6. Mr. Freeman was well known in the electrical field and was considered an authority on the subject of underground fibre conduit, which he had manufactured for more than 30 years. Many improvements in the manufacture of this material are the result of his thorough understanding of field requirements, and his research.

He was associated with United States companies until 1929, when he went to Canada and organized the Fibre Conduit company. He designed and installed the machines at the new factory which he built at Cornwall. The manufacture of this material in Canada was looked upon favorably by British Empire countries, and he was successful in seeing his material widely used in all parts of the Empire and in many foreign countries.

Walter A. Olen One of Manufacturers' Speakers

Walter A. Olen, president and general manager of the Four Wheel Drive Auto Co., Clintonville, Wis., has been selected as one of the authorized speakers for the National Association of Manufacturers.

This appointment, made at the annual convention of the association held recently at New York City, authorizes Mr. Olen to explain the principles and viewpoints of industry before any and all types of civic and community groups. Through intensive study, long industrial experience and world-wide travels he has gained recognition as an authority on the subjects of industrial trends, safety, and co-ordinated transportation.

WALTER A. OLEN, Selected as Authorized Speaker of the National Association of Manufacturers.

Frameless Steel Buildings for Dial Exchanges

Proved advantages of frameless steel insulated buildings for unattended dial exchanges, evident after a two-year installation test, have prompted the Peoples Telephone Corp., of Butler, Pa., to order the construction of two additional units. The buildings are designed and constructed by the Insulated Steel Construction Co., of Middletown, Ohio.

Early in 1934, because of several unhappy experiences, officials of the telephone company became interested in modern steel construction. After careful investigation, they accepted a design submitted by the Middletown company. It was for a substation building at North Washington, Pa. This station measures 10 ft. by 16 ft., with a ten-foot ceiling height. Later a second station, measuring 11 ft. by 15 ft., with a ten-foot ceiling height, inside dimensions, was erected at Parker's Landing, Pa.

The Insulated Steel Construction Co. recently received two more orders from

(*Concluded on page* 34)

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Buyer's Weekly Guide

A list of firms and companies offering equipment, supplies or services for operating telephone companies

ADDING MACHINES

Burroughs Adding Machine Company, Second Blvd., Detroit, Mich. — Adding, Bookkeeping, Calculating, Billing and Accounting Machines, Electric Carriage Typewriters, Standard Typewriters, Operator Correct-Posture Chairs. Burroughs machines are in use today in hundreds of progressive telephone companies throughout the country.

BATTERIES—DRY CELLS

Burgess Battery Co., Freeport, Ill.—Burgess Flashlights and Uni-Cel Flashlight Batteries—for dependability and service. The Burgess Twin-Six Telephone Battery—a 3-volt unit designed to replace two No. 6 cells, with longer life, lighter weight, smaller size and a leakproof case. The Burgess Little-Six—replaces the old type No. 6 cell, is smaller and lighter, will not ooze or bulge, has all the electrical capacity of the standard No. 6 cell.

National Carbon Company, 30 E. 42nd St., New York.—"Columbia" Telephone Dry Batteries; "Eveready" Flashlights, Flashlight Batteries and Long Life Dry Cells, "National Pyramid" brushes, carbon, graphite and metal graphite for motors, generators and rotary converters. "Eveready" Prestone anti-freeze; "Eveready" Rustone rust preventive; and "Eveready" Air Cell telephone operators' transmitter batteries.

Ray-O-Vac Company, Madison, Wis.—Ray-O-Vac telephone batteries — longer life and better service proven by tests in accordance with U. S. Government standards and records of users. Ray-O-Vac flashlights and industrial flashlight batteries are other items showing Ray-O-Vac's outstanding quality.

BATTERIES—STORAGE

The Electric Storage Battery Company, Allegheny Ave. and 19th St., Philadelphia, Pa.—Exide Storage Batteries. Branches: Boston, New York, Rochester, Philadelphia, Pittsburgh, Washington, Atlanta, Cincinnati, Cleveland, Detroit, Chicago, Kansas City, Minneapolis, St. Louis, Denver, San Francisco and Seattle.

Philco (Battery Division) Tioga and C Streets, Philadelphia, Pa.—Philco Flote in Steel-Glass Storage Batteries for P. B. X. and central office operation. Your old batteries will command a liberal allowance toward any Flote in Steel-Glass Cell from 10 A.H. to 1056 A.H. Write now for catalog ...it will tell you the complete story of Flote in Steel-Glass—the finest of telephone batteries.

BATTERY CHARGING EQUIPMENT

General Electric Company, Bridgeport, Conn.—Tungar battery chargers. G-E pole line hardware. Cable filling compound.

CABLE—LEAD ENCASED

American Electrical Works, Phillipsdale, R. I.—Paper telephone cable, switchboard cable, bare copper wire. Chicago Office: 20 N. Wacker Drive; Cincinnati: Traction Bldg.; New York: 100 E. 42nd St.

British Insulated Cables, Ltd., Surrey House, Embankment, W. C. 2, Factory: Prescot, Lancashire, England.—Telephone cable of all sizes and capacities.

General Cable Corporation, 420 Lexington Ave., New York, N. Y.—Paper telephone cables of standardized manufacture for over forty years. Weatherproof and insulated copperweld drop wire.

Eugene F. Phillips Electrical Works, Ltd., Montreal, Can.—For any type of wire or cable used in telephone, telegraph or power work get in touch with "Phillips." Manufacturers of bare and insulated copper wires, rubber insulated wires, enameled wire, magnet wire, telephone cables, power cables, switchboard cables, flexible cords, copper rods, etc.

CABLE RINGS

National Telephone Supply Company, 5100 Superior Ave., Cleveland, Ohio.—National Cable Rings, National Splicing Sleeves, Non-Breakable Messenger Cable Hangers, Marlin and Swisher Cable Hangers and Custom Galvanizers. National cable rings are practical because they are two-way,—they allow the cable to be pulled in either direction. National sleeves make secure the weakest points in the line. If it's a splice—make it a National.

CABLE TERMINALS

Cook Electric Company, 2700 Southport Ave., Chicago, Ill.—Protective Pole Cable Terminals, Unprotected Pole Cable Terminals, central office protection, lighting arresters, sleeves, fuses.

Reliable Electric Company, 3145 Carroll Ave., Chicago, Ill.—Complete line of cable terminals, telephone and switchboard protectors, sleeves, fuses, solderless wire connectors and specialties.

CARBON DIAPHRAGMS

Noris Carbon Company, Inc., 160 5th Ave., New York, N. Y.—Carbon diaphragms, carbon back plates, granular and globular carbons, lightning arresters.

CORDS, CABLE AND WIRE

Lenz Electric Manufacturing Co., 1751 N. Western Ave., Chicago—Established 1904—telephone and switchboard cords for all makes of equipment, braided and lead-covered telephone cable, flame-proof jumper wire, interior telephone wire, switchboard wire.

CORDS AND WIRE

Runzel Cord & Wire Co., 4727-31 Montrose Ave., Chicago—Telephone and Switchboard Cords, Flame-proof Jumper Wire, Switchboard Wire, Interior Telephone Wire. W. L. Runzel, President, has devoted over 40 years to the making of fine telephone cords.

ELAPSED TIME RECORDERS

Calculagraph Company, 50 Church St., New York, N. Y.—Calculagraph is the world's standard elapsed time recorder and gives you toll records printed with elapsed time to the second. Both spring driven and electric motor models are available.

POLES

B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

International Creosoting and Construction Company, Galveston, Texas—Creosoted Southern Yellow Pine Poles. Plants: Beaumont and Texarkana, Texas.

Jordan Bros. Lumber Co., Box 84, Norfolk, Va.—Virginia White Cedar Poles. Plain or charred and creo-treated butts.

MacGillis & Gibbs Company, Milwaukee, Wis.—Northern White and Western Red Cedar Poles. Plain or butt-treated. Immediate quotations on request.

Michigan Pole & Tie Company, Newberry and Grand Rapids, Mich. — "Poles with Character." Northern White and Western Red Cedar. Strategically located yards, Minneapolis, Minn., and Reed City (Lower Michigan), insure quick deliveries.

Naugle Pole & Tie Co., 5 South Wabash Ave., Chicago, Ill. Northern White and Western Red Cedar Poles. Plain or butt-treated. Let us quote you our new low prices.

H. Sigalet & Company, Ltd., Lumby, B. C., Canada — Western Red Cedar Poles. Plain or Butt treated.

Valentine Clark Corporation, 2516 Doswell Ave., St. Paul, Minn.—Finished Cedar Poles. Plain or Butt treated.

SUPPLIES, SWITCHBOARDS AND INSTRUMENTS

American Automatic Electric Sales Company, 1033 West Van Buren Street, Chicago, Ill.—Public Automatic Telephone Systems, Private Automatic Telephone Systems, Central Battery and Magneto Manual Telephone Switchboards, Remote Control Switchboards, Telephone Instruments of all types, Battery Eliminators, Charging Equipment, Signaling and Control Apparatus, Cords, Wires, Cables, Monotype Copperweld Drop Wire, and a complete line of construction materials and supplies.

Automatic Electric Company, 1033 W. Van Buren St., Chicago, Ill.—Public Automatic Dial Systems, Private Automatic Dial Systems, Telephones, relays, signalling and control equipment.

Automatic Electric Company, Ltd., Milton Road, Edge Lane, Liverpool, England.—Automatic Telephone Equipment.

Automatic Electric Sales Company, Ltd., 1027 W. Van Buren St., Chicago, Ill.—Public Automatic Dial Systems, Private Automatic Dial Systems, Manual Telephone Equipment, telephones, storage batteries, wire, cable, poles, etc.

Kellogg Switchboard & Supply Company, Adams & Aberdeen Sts., Chicago, Ill.—Engineers and designers, manufacturers and suppliers of complete equipment for telephone exchanges and communication systems. Manufacturers of "Master-built" Common Battery, Magneto and PBX Switchboards, "Masterphone" Telephone Instruments, and a complete line of telephone supplies, including bronze drop and interior wire.

North Electric Manufacturing Company, Galion, Ohio—Machine switching telephone systems. Automanual and Automatic. "All-Relay" Switching Apparatus (Dialless and Dial Control). Unattended Satellite Systems.

Siemens Brothers & Company, Ltd., Woolwich, England—Automatic and Manual Telephone Equipment.

Stromberg-Carlson Telephone Manufacturing Company, 100 Carlson Road, Rochester, N. Y. — Telephone apparatus of all kinds, switchboard cords, cable and general telephone supplies.

TOOLS

Crescent Tool Co., Jamestown, N. Y.—CRESTOLOY Pliers, Curved Needle Nose Pliers, Heavy Diagonal Cutting Pliers, Linemen's Side Cutting Pliers, End Cutting Nippers, Crescent Hack Saws.

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WRITE TODAY for additional information and samples of our business promotion plan for independent telephone companies.

PRINTING DEPARTMENT

SUTTLE EQUIPMENT CO.

LAWRENCEVILLE, ILLINOIS

NEED TOLL TICKETS?

Write: Specialty Printers,

Bristol, Tenn.

Reconditioned Switchboards

P. B. X.

Magneto

Common Battery

Telephones

C. B. wall and desk

Magneto wall and desk

(all types)

BUCKEYE TELEPHONE AND SUPPLY CO.

COLUMBUS, OHIO

SPECIALISTS IN

Rebuilding and Repairing

TRANSMITTERS

Absolutely finest workmanship guaranteed.

Baked, black, velvet finish. New granular carbon. Workmanship, adjustments and tests made with the latest and most improved apparatus. 50c each less backs. One-year money-back guarantee.

Full information on request

THIS WEEK'S SPECIAL

300-Line Main Distributing Frame —either with or without protectors; price, without protectors $75.00

Cook No. 10 Protectors for above frame, per strip of 20 ..... $5.00

Telephone Repair Shop

Rogers Park Station **Chicago**

ATTENTION . . . BARGAINS

TELEPHONE BOOTHS refinished like new, new style folding door, $24.00. 3,000 boxes of new ¾"x3¼" wax sleeves, $0.25 per box of 175 pieces. No. 1 wire grips (Buffalo Grips) like new, $1.00. Simplex Reel Jacks, 10-ton capacity, good as new, $7.50 each. Prices F. O. B. Chicago.

WM. M. MILLER & SONS

2553 W. Madison St. Chicago, Ill.

PEARL Life-time Drop-Wire BRACKETS

Save time, eliminate trouble. Hot galvanized screw-hooks and malleable castings are separable and indestructible. Standard 2-groove porcelain. Stocked by Telephone Manufacturers.

WM. H. PEARL CO. Indianapolis, Ind.

POSITIONS WANTED

EXPERIENCED COMMERCIAL SUPERVISOR AND SALESMAN—Now employed with Bell, desires position with Independent, where ability will result in advancement. Go anywhere. Address 8805, TELEPHONY.

YOUNG MAN, thoroughly experienced in engineering, construction, operation and management of telephone plants—both manual and automatic—would like to hear from manager-owner who desires competent man to relieve him of managerial responsibilities. Will consider taking financial interest. Address 8491, care of TELEPHONY.

(*Concluded from page* 32)

the same company for substations to be erected at Eau Claire and Sunbury, Pa.

Wall sections of frameless steel are made of 20-gage Armco steel sheets, manufactured by the American Rolling Mill Co., of Middletown, Ohio. They are formed into cells measuring roughly 3 ins. by 10 ins. Sections are protected with suitable rust-resisting compounds, thoroughly insulated with vermiculite. Walls and roof are fabricated in the shop in large sections, so constructed as to form a continuous flat surface on both sides as well as above and below.

Exteriors of the buildings are covered with porcelain enameled sheets, attached to the walls by aluminum clip-strip. This encircles the building in horizontal rows, which are placed the proper distance apart to receive the porcelain enameled sheets and corner details.

In addition to being fireproof, the buildings are considered to be ideal structures because of the elimination of radio interference and dusting.

A simple frame on which equipment is hung allows ready access from both front and rear. Because of the type of building the usual steel case can be eliminated.

Power lines and telephone cables are carried in specially-built conduits within the walls which are attached to the hollow framework and battery rack.

The buildings are heated with fan-equipped gas heaters. When the building is unoccupied, a thermostat maintains the temperature at 40 degrees. While employes are working in the building, the thermostat is set to a temperature of 70 degrees.

▼ ▼

Department Store Offers Novel Service

A well-known New York City department store has introduced a new feature or service which is brought to public attention in the winter issue of its "Handy Guide for Household Needs." The new activity is a telephone service, designated as "By Telephone—We Call You" and "Or, By Telephone—You Call Us."

A specially-trained staff of men and women has been assigned the task of taking orders by telephone, of answering questions, and also—but only upon request—of advising about the uses of merchandise.

The "We Call You" service applies to anyone living in New York City and adjoining suburbs. A member of the "We Call You" staff will telephone persons who request the service, regularly every week or at any other interval that best suits, in regard to merchandise, special offers, and other interesting store news.